Medical Library

DEC 1 [illegible] 1939

The Research Quarterly

of the

American Association for Health, Physical Education, and [illegible]

VOL. X DECEMBER, 1939 [illegible]

Some Unexplored Areas for Research. *C. H. McCloy* [illegible]

The Field of Research in Recreation. *Martin H. Neumeyer* [illegible]

The Coeducational Physical Education Class Program at the College Level. *Louise S. Cobb* . . . . . [illegible]

Specific Diets and Athletic Fitness: A Preliminary Investigation. *George Z. Dupain* . . . . . [illegible]

Some Differences in Bodily Proportions between American Negro and White Male College Students as Related to Athletic Performance. *Eleanor [illegible]* . . . . . [illegible]

Standards for Testing Beginning Swimming. *Thomas Kirk Cureton, Jr.* . . . . . [illegible]

An Experiment in Self-Directed Study for College Freshmen. *Paul D. Guernsey* . . . . . [illegible]

A Survey to Determine the Status of Summer Camps for Women in Colleges and Universities of the South, Combined with a Survey of Methods of Teaching Swimming. *Elizabeth Conn, Helen Pendergast, and Margaret McCall* . . . . . [illegible]

A Brief Survey of the Present Status of the Health and Physical Education Requirement for Men Students in Colleges and Universities. *K. J. McCristal and [illegible] A. Miller* . . . . . [illegible]

Motor Ability Tests for High School Girls. *Elizabeth Powell and Eugene C. Rowe* . . . . . [illegible]

Chemical Factors of Fatigue. *John F. Gourley* . . . . . [illegible]

Selected Bibliography for 1938. *G. L. Allen* . . . . . [illegible]

Book Reviews . . . . . [illegible]

Index to Volume X (1939) . . . . . [illegible]

PERIODICALS
BOOKS
GENERAL PRINTING

Prompt Service
Workmanship
Moderate Prices

Ask for Quotations

THE ANN ARBOR PRESS
317 Maynard Street
Ann Arbor Michigan

Copyright 1930 by American Association for Health, Physical Education, and Recreation
Entered as second class matter March 22, 1930, at the Post Office at Ann Arbor, Michigan, under the act of March 3, 1879.

The Research Quarterly

of the

American Association for Health, Physical Education, and Recreation

ELMER D. MITCHELL, Ph.D., *Editor*

Vol. X **DECEMBER, 1939** **No. 4**

CONTENTS

Some Unexplored Areas for Research. *C. H. McCloy*..... 3

The Field of Research in Recreation. *Martin H. Neumeyer*..... 11

The Coeducational Physical Education Class Program at the College Level. *Louise S. Cobb* 20

Specific Diets and Athletic Fitness: A Preliminary Investigation. *George Z. Dupain* 33

Some Differences in Bodily Proportions between American Negro and White Male College Students as Related to Athletic Performance. *Eleanor Metheny* 41

Standards for Testing Beginning Swimming. *Thomas Kirk Cureton, Jr*..... 54

An Experiment in Self-Directed Study for College Freshmen. *Paul D. Guernsey* 60

A Survey to Determine the Status of Soccer for Women in Colleges and Universities of the South, Combined with a Survey of Methods of Teaching Soccer. *Elisebeth Conn, Helen Pendergast,* and *Margaret McCall*..... 66

A Brief Survey of the Present Status of the Health and Physical Education Requirement for Men Students in Colleges and Universities. *K. J. McCristal* and *Emil A. Miller* 70

Motor Ability Tests for High School Girls. *Elizabeth Powell* and *Eugene C. Howe* 81

Chemical Factors of Fatigue. *John T. Goorley* 89

Selected Bibliography for 1938. *G. B. Affleck* 103

Book Reviews 155

Index to Volume X (1939) 160

CONTRIBUTING EDITORS

G. B. Affleck
Dorothy Ainsworth, Ph.D.
V. S. Blanchard
John Bovard, Ph.D.
David K. Brace, Ph.D.
A. D. Browne, M.D.
C. L. Brownell, Ph.D.
Rosalind Cassidy, Ed.D.
Charles C. Cowell, Ph.D.
Frederick Cozens, Ph.D.
A. Lester Crapser, Ph.D.
Ruth Elliott, Ph.D.
Marguerite M. Hussey, Ph.D.
Peter V. Karpovich, M.D.
Charles H. Keene, M.D.
Frank L. Kleeberger
C. V. Langton, D.P.H., Ed.D.
William R. LaPorte
Mabel Lee
Frank Lloyd, Ph.D.
F. W. Luehring, Ph.D.
C. H. McCloy, Ph.D.
J. H. McCurdy, M.D.
C. M. Miles, Ph.D.
Gertrude E. Moulton, M.D.
Jay B. Nash, Ph.D.
N. P. Neilson, Ph.D.
D. Oberteuffer, Ph.D.
W. W. Patty, Ph.D.
Frederick Prosch
F. R. Rogers, Ph.D.
Harry A. Scott, Ph.D.
J. R. Sharman, Ph.D.
George T. Stafford, Ed.D.
Arthur H Steinhaus, Ph.D.
Alden W. Thompson
W. W. Tuttle, Ph.D.
Agnes Wayman
Jesse F. Williams, M.D.

Published in March, May, October, and December by the American Association for Health, Physical Education, and Recreation, 1201 Sixteenth Street, N.W., Washington, D.C. Subscription, $3.00 per year; single copies, $1.00.

Send subscriptions to: 1201 Sixteenth Street, N.W., Washington, D.C.

Editorial and Advertising Office: 311 Maynard Street, Ann Arbor, Michigan. Advertising rates on application.

American Association for Health, Physical Education and Recreation

Officers

President, Margaret Bell, M.D., University of Michigan
President-Elect, Hiram A. Jones, Albany, N.Y.
Past President, Frederick W. Cozens, University of California at Los Angeles
Vice-President (Health Education), Ethel Mealey, Portland, Oregon
Vice-President (Physical Education), Paul Washke, Eugene, Oregon
Vice-President (Recreation), E. Dana Caulkins, White Plains, New York
Executive Secretary-Treasurer, N. P. Neilson, Washington, D.C.

Additional Members of Governing Board

Central District: Willard N. Greim
Eastern District: Alice C. Aldrich
Midwest District: Helen Hazelton
Northwest District: Helen G. Smith
Southern District: Anne S. Duggan
Southwest District: Catherine Worthingham
Members-at-large: C. E. Turner, Jay B. Nash, Jess W. Hair

Officers of Central District Association

Pres., Willard Greim, Denver Public Schools
Pres.-Elect., Helen Manley, University City, Mo.
Vice-Pres., P. E. Mickelson, Fargo, N.D.
Sec.-Treas., J. H. Morrison, Wayne, Neb.

Officers of Eastern District Association

Pres., Alice C. Aldrich, Montpelier, Vermont
Pres.-Elect, W. L. Hughes, NewYork City
Vice-Pres. (Health), Walter Cox, Ithaca, N.Y.
Vice-Pres. (Physical Education) Loretta Ryan, New York City
Vice-Pres. (Recreation), L. C. Schroeder, Pittsburgh
Sec.-Treas., Grace Jones, Summit, N.J.

Officers of Midwest District Association

Pres., Helen Hazelton, Purdue University
Vice-Pres., A. H. Pritzlaff, Chicago
Sec.-Treas., Ben W. Miller, Indiana University

Officers of Northwest District Association

Pres., Helen G. Smith, Pullman, Wash.
Vice-Pres., William Nollan, Seattle, Wash.
Pres.-Elect, A. C. Pelton, Seattle, Wash.
Sec.-Treas., Rnth Wilson, Seattle, Wash.

Officers of Southern District Association

Pres., Anne S. Duggan, Denton, Texas
Pres.-Elect, Len T. Sherrill, University, La.
Vice-Pres., Helen Corrubia, Tulsa, Okla.
Sec., Jess W. Hair, Baton Rouge, La.
Treas., M. E. Potter, Lexington, Ky.

Officers of Southwest District Association

Pres., Catherine Worthingham, Stanford Univ.
Vice-Pres., Dudley DeGroot, San Jose, Cal.
Sec.-Treas., Bernice Moss, Salt Lake City, Utah

Additional Members of Legislative Council

Administrative Directors: W. K. Streit
Administrative Measurements: Elizabeth Graybeal
Alabama: Minnie Sellers, J. R. Garrison
Amer. Acad. of P. E.: Arthur H Steinhaus
Amer. School Health Assn.: Dr. C. H. Keene
Arizona: Ina Gittings
Arkansas: Mrs. W. E. Bates
California: Grover Gates, C. L. Glenn, Edith Lindsay, W. H. Orion, E. H. Trethaway
Camping: Mrs. Agnes Stacy
Canadian P. E. Assn.: Dr. A. S. Lamb
College Men's P. E.: Glenn Howard
College P. E. Assn.: Harold S. Wood
Colorado: Willard N. Greim, Clare Small
Connecticut: Estelle Cuddy, C. C. Wilson
Dance: Lucile Czarnowski
Delaware: C. Walter Kadel
Delta Psi Kappa: Grace O. Hunter
District of Columbia: Jenny Turnbull
Florida: Dr. E. Benton Salt
Georgia: Mrs. H. S. Wootten
Health Education Teacher Training: Anita Laton Conrad
Health Instruction: Arthur H Steinhaus
Illinois: Mrs. Nellie B. Cochran, K. B. Flanagan, Don C. Seaton, S. C. Staley
Indiana: Ben W. Miller, Gertrude Reynolds
Intramural Athletics: C. W. Hackensmith
Iowa: P. F. Bender, John Johnson, Ruth Ziecke
Kansas: Ruth Hoover, E. A. Thomas
Kentucky: H. T. Taylor
Louisiana: Jess W. Hair
Maine: Linwood Dwelley
Maryland: Donald Minnegan
Massachusetts: T. H. Hines, Eleanor Quinlan
Men's Athletics: John Van Why
Mental Health: Dr. James Houloose
Michigan: Roy McMurray, Mabel Rugen, Grace Ryan
Minnesota: H. K. Jack, C. L. Nordly
Mississippi: S. L. Robinson
Missouri: Darwin Hindman, Helen Manley
Montana: Erma Monroe
National Assn. of Directors of P. E. for College Women: Dorothy Ainsworth
National Collegiate Ath. Assn.: J. H. McCurdy
Nebraska: Ruth Diamond
Nevada: J. W. Coleman
New Hampshire: Raymond Hoyt
New Jersey: A. G. Ireland, Helena Kees, Marianna Packer
New York: E. H. Champlin, C. J. Kraft, Jr., H. A. Jones, Paul Krimmel
North Carolina: Christine White
North Dakota: Harry Weinbergen
Ohio: P. C. Bechtel, Lewis S. Moorehead, D. Oberteuffer
Oklahoma: Valerie Colvin, Flora May Ellis
Oregon: L. J. Sparks
Pennsylvania: E. C. Davis, Elizabeth McHose, W. F. Meredith, Frederick Prosch
Phi Delta Pi: Mrs. Gret Hendricks
Private Schools: Captain William Palmer
Public Schools: Ralph C. Tapp
Recreation Leadership: Floyd Eastwood
Recreation Program: A. W. Thompson
Recreation Research: George Gloss
Research: Ruth Bass
Rhode Island: John H. Osterberg
Safety: Julius Kuhnert
School Nurses: Lulu V. Cline
School Nutrition: Martha Koehne
School Physicians: Dr. Don W. Gudakunst
Society of State Directors: C. Harry Edwards
South Carolina: Frances Major
South Dakota: J H. Morrison
Teacher Training: D. Oberteuffer
Tennessee: A. W. Hobt
Texas: D. K. Brace, G. L. Hermance, Harry A. Scott
Therapeutics: Catherine Worthingham
Utah: H. B. Hunsaker
Vermont: Mrs. Alice C. Aldrich
Virginia: Grace Chevraux
Washington: Helen G. Smith, Leslie L. Hoar
West Virginia: Grace Griffin, Harry L. Samuel
Women's Athletics: Jane Shurmer
Women's Division N.A.A.F.: Anne F. Hodgkins
Wisconsin: Fred Hein, Frank Stangel
Y.M.C.A. Physical Directors Society: Dr. John Brown, Jr.
Y.W.C.A. Health Education Directors Society: Edith M. Gates

Some Unexplored Areas for Research

By C. H. McCloy
State University of Iowa

IT IS occasionally profitable for those overly-close to the problems of research to retreat a bit from the scene of immediate action and look over the whole professional field. We are apt to discover a number of interesting but relatively unexplored areas toward which it may seem desirable to turn our attention.

The results are not equally profitable in all such fields. Some interesting and intriguing problems will obviously be unproductive of results that will make a vital difference to the profession. In making my selections of problems or areas of research, I shall be guided by the relative probable usefulness of the results to be obtained. Not all of these areas suggested are completely unexplored. All are known to some of you, at least, and while a few have been opened up, others present almost virgin territory.

As an introductory thought, I should like to point out that all good research is not of necessity "scientific" or objective. There are many areas for the philosophically directed, logical thinking type of research, where competently directed studies would probably advance physical education practice much more than would most "scientific" research which uses more objective methods.

In this paper, I shall limit my discussion primarily to the field of physical education and omit almost entirely reference to studies in the fields of recreation and health education.

To approach the subject somewhat systematically and from a common-sense point of view, I shall divide these areas into six groups:

I. Researches that will aid in a better understanding of the individual.

II. Researches relative to our objectives. What do we want?

III. Researches that relate to more adequate means of attaining our objectives. How can we get what we want?

IV. Researches that relate to measuring our progress towards our objectives.

V. Researches in the field of curriculum.

VI. Miscellaneous studies that may cut across a number of areas.

I shall simply list the problems and comment briefly upon each one.

I. RESEARCHES RELATING TO THE GENERAL UNDERSTANDING OF THE INDIVIDUAL AND HOW HE FUNCTIONS

Much physical education practice is based upon biological assumptions that have never been adequately validated by scientific facts. Hence, my first group of questions relates to such problems.

1. What are the effects of long continued programs of exercise upon the human organism? Some studies of this type should probably be conducted on rats. We have based much of our practice upon the teachings of Professor John M. Tyler,[1] but the objective evidence for his teachings is hard to find. This field needs careful exploration from many angles. Cooperative studies with students of cell physiology might prove to be exceedingly profitable.

2. How much or what dosage of exercise is desirable? What price athletics? What are the effects of long-time strenuous training? The studies by Rowe[2] would indicate that overstrenuous activity upon the part of boys of junior high school age is undesirable, but that milder activities are a distinct asset. These studies need confirmation, and much more work needs to be done in this field with both sexes, at all age levels below senility.

3. What is the relationship of proper dosages of exercise to longevity? [3] Statistical studies in this field have not been very convincing, largely because of the lack of control of other factors. This type of study should probably be divided into two sub-types; one which studies the effects of exercise when it has been continued into middle and old age and one in which the individual has trained rather conscientiously up to what corresponds to the college age and has then become sedentary. This problem would seem to be adapted to experimentation with rats, as well as to statistical analysis.

4. What is the effect of programs of exercise and hygienic living on the prevention of functional old age? There is a scientific society with headquarters in Rumania[4] which was formed primarily for the purpose of studying the cause and prevention of old age. It would seem to me that physical education has much to contribute to this problem. Can we prolong functional youth? What about the problem of *keeping* one's functional youth versus *regaining* it after it has been lost?

5. What are the effects of physical exercise programs of different degrees of intensity on the resistance to ordinary infections? This study

---

[1] John M. Tyler, *Growth and Education*. (Boston: Houghton Mifflin Company, 1907); C. H. McCloy, "Forgotten Objectives of Physical Education," *Journal of Health and Physical Education*, 8:8 (October 1937) 458.

[2] Floyd A. Rowe, "Growth Comparison of Athletes and Non-athletes," RESEARCH QUARTERLY, 4:3 (October 1933) 108.

[3] Louis I. Dublin, "Longevity of College Athletes," *Harper's Monthly Magazine*, July, 1928.

[4] Institut für Altersforschung und Altersbekämpfung. Rumänien. Chisinau, Str. Unirii, 20.

might be done on rats or statistically on students in some large institution where all live on the campus.

6. What is the optimum amount of strength for the best and richest living? This would probably be different, of course, for each age and sex.

7. What is the effect of landing shock, etc., on the female organism? A former study on this subject needs further amplification.[5]

8. What are the effects of proper or improper diet upon the development of the organism? Considerable has been done on this problem, but evidently much more needs to be done. The studies by Price[6] in Cleveland have been most thought provoking.

9. What is health? What kinds of health are there? How can it be defined and how sought? How can we determine varying qualities of the different tissues?

Another important series of relatively unexplored problems in this area gathers around individual differences in structures and functions as related to physical education and to health. Many of these may be explored with anthropometric techniques, this term being used in its broader sense to include certain functional measures as well as structural ones.

10. What can we learn about the evolution of body build and physical structure? Considerable evidence has been recently uncovered which indicates that some people have evoluted further than others from their pre-human ancestors. These facts undoubtedly should affect our standards of body mechanics.

11. What is the relationship of individual differences in body build to normal body mechanics? In the light of these structural differences, what should be a proper posture—sitting, standing, and walking—for each individual, and how may it be determined? The same kinds of problems apply to the mechanics of the feet and to the mechanics of movement in general.

12. What sex differences of structure are significant to the physical education program? A great deal has been written on this subject without much reference to the scientific evidence.

13. What are the racial differences in body proportions, functional abilities, etc., in this country, particularly differences between the negro and white races? It is known, for example, that the average lung capacity of the negro at each age is approximately 20 per cent less than the corresponding average for the white race. Very little is known, however, about other functional differences.

14. What is the relationship between basal metabolic rate and age,

---

[5] C. H. McCloy, "A Study of Landing Shock in Jumping for Women," *Arbeitsphysiologie* 5:1 (August 1931) 100.

[6] Weston A. Price, "New Light on Modern Physical Degeneration from Field Studies among Primitive Races," *Ohio State Medical Journal*, 33 (September 1937) 965.

build, over- or underweight, general nutritional status, and the general level of physical functioning?

15. What is the relationship of body build to athletic performance, to potential strength, to general glandular make-up, to breathing capacity, etc.?

II. PROBLEMS RELATED TO OUR OBJECTIVES AND GOALS

Many of these problems will demand a subjective philosophical approach. Part of the problem of objectives is one of relative balance: the biological vs. the educational; skills vs. recreation; program content vs. the integration of the personality. We seem again to have reached a point where some of this thinking and evaluation needs to be done anew. Part of the research in this field needs to be centered around a reimplementation of techniques for selecting activities more intelligently.

We need, then, to have:

16. Studies in balance of objectives. Which group should have the greatest emphasis?

17. Studies for the formulation of adequate *general* criteria for the selection of subject matter.

18. Studies for the formulation of adequate criteria for the selection of subject matter in *each kind* of activity, such as, for example, informal games. Among such criteria should be some which would determine when an activity should be introduced and when it should be removed from a curriculum.

19. Researches centered around the field of the dance. This is a field in which, it seems to me, the thinking is more emotional than scientific. There is no law of nature that states that an art may not be studied scientifically, and interpreted with sound logic, and this field is one in which many useful studies, both scientific and philosophical, might well be projected.

20. Studies in the field of skills. These studies, it would seem to me, should be closely tied to parallel studies of kinesiology and body mechanics, particularly to the end that fundamental skill patterns which should carry over to other similar activities may be discovered and described. A good start might be made by a careful observational analysis of what it takes to be proficient at each kind of skill. This should be followed by experimental studies.

21. Studies in objectives for corrective physical education. In the light of recent anthropological studies in this field, what should be our goals?

III. RESEARCHES IN HOW TO ACHIEVE RESULTS

Because of the nature of the case, many of the studies in this area will be of a psychological type.

22. Researches in the formulation of a valid and usable account of the original nature of man from the standpoint of the teacher of physical education. Studies of this type would be both philosophical and experimental.

23. Studies of individual differences, particularly individual differences of interest. Assumptions are frequently made that everyone does or should like a certain type of activity and should not like another type. What are the relevant facts? What proportion of people distinctly like hiking, or the so-called body building, for example? What proportion dislike certain ball games, swimming, or the dance? What proportion are motivated to engage in physical activity by a desire for a better physical development or a more beautiful carriage? What proportion are and are not strongly competitive by nature?

24. Studies in the utilization of the special senses as related to activity programs. The obvious problems center largely around the function of vision. How can we best use the eyes to aid in such events as the pole vault, hurdling, dribbling a basketball, and a host of other activities? The kinesthetic sense and balance offer other fruitful fields of study.

25. Studies in the transfer of skills. This again relates to the discovery of the fundamentals of skills, both mechanical and psychological, to determine which ones have a sufficient number of common elements to carry over. Methods of teaching these skills will also affect the problem of transfer, and such methods should be studied.

26. Studies upon how best to teach skills, such as:

a) What are the best places to use the whole method and the part method?

b) When we should use the whole method, what is a functional "whole" in any given activity?

c) What are the effects of various types of awards?

d) What is the influence of group discussion upon learning?

e) What leadership techniques are best, both as related to teacher and to pupils?

f) What is the best size of a physical education group at each age level? Beyond what size do educational results fall off sharply?

27. Researches in the development of character qualities through physical activity programs, especially those centering around how to change the child himself, rather than simply to change his environment.

28. Studies in the best way to observe and evaluate the character status of the child. How can this evaluation be made more objective?

29. Problems having to do with mental hygiene in the physical education program. What incentives are justified? To what extent are children (and teachers!) maladjusted? What problems of mental

hygiene are most urgent in physical education? How can they best be met?

30. Studies in the psychology of motivation for constructive participation in physical education and health education programs.

31. Studies in the relationship of physical education skills teaching and safety education. This may be illustrated by the teaching of proper foot work, such as is usually taught only to basketball squads, introduced into the lower grades as a prophylactic against traffic accidents.

IV. STUDIES PERTAINING TO THE MEASUREMENT OF PROGRESS TOWARDS THE ACHIEVEMENT OF OBJECTIVES

Many methods of measurement will be useful only for research and will be too complicated for ordinary use. Such tests are useful, however, as implements of research for the seeking of further progress in our profession. I should suggest that in the future many test research workers begin thinking about methods of measuring the present status of the individual and measuring his progress towards each important specific objective, with a view to formulating and validating simple, practicable tests of this type.

Studies in this area might center around the following things:

32. Determination of what are the component elements of individual capacities and abilities to be measured. The statistical techniques of the factor analysis seem to lend themselves well to this type of investigation. This method of discovering components of activities, skills, or emotions, should always be followed up with verifying experimental studies.

33. Measurements of fundamental abilities and of achievement fundamentals in general.

34. Measurements of motivation and self-testing. These measurements would be primarily simple practice tests in the field of achievement, and progress in the skill required for the test should contribute directly to skill in the activity itself.

35. Measurement of general individual biological condition. In the attempt to measure health, there are numerous individual items such as general health condition, endurance, the sort of thing that is thought of as general physical or athletic condition other than health in the narrower sense of the word—and perhaps a number of others. Our vocabulary and our thinking tools in this area are not well differentiated. There will probably be discovered a number of individual components of health which will eventually clear up this problem. Their discovery is an urgent need.

36. Measurements of general motor capacity. The present ones are in need of revision. These should be divided into two types: (1) measurements of general motor capacity or potentiality, (2) more specific

measurements of capacity, such as those of capacities for specific games of various kinds, or of swimming.

37. Measurements of various kinds of motor educability. There are at least two kinds: general motor educability and general athletic educability, each of which undoubtedly has a number of separate components, some of which are sensory. It has been found that paper and pencil tests of ability to visualize spatial relations correlate about .7 with football educability or smartness. This is an exceedingly rich field for exploration and one in which further developments will contribute much to a helpful evaluation of the pupil.

38. Measurements related to swimming. We need to know more about how to measure resistance in the water simply, how to measure buoyancy, and how to relate these and other things to probable ability to learn to swim, using various strokes. We need to know more about the relationship of body build to resistance in the water.

39. Determination of what are the best and simplest methods of classification for each important kind of activities, not just for class work or athletics in general.

V. RESEARCHES IN THE FIELD OF CURRICULUM

This field is not thought of here simply in the sense of ***what*** to teach, but partly of ***how to organize*** and select materials and ***how to teach them*** (method). These three aspects of education must be integrated if the best results are to be attained. Some of the important questions involved in this area seem to me to be:

40. What is the psychological and physiological nature of the child at all ages? This is a problem that has never been really adequately attacked from the standpoint of the needs of the physical educator in the light of relatively recent findings. The general psychological and physiological types at the various age levels for each sex should be determined by experimentation, not by the tabulation of the opinions of those who do not really know.

41. How can we organize the teaching materials so that both the current development of the child and an adequate preparation for living after school ages may be attained? This probably means more adequate and integrated curriculum research both from the so-called child-centered point of view and from the subject matter point of view.

42. How can we organize teaching material so that better and more effective teaching may be achieved, looking perhaps to the time when an adequate physical education may have been fully attained by the age of sixteen, when in our commonwealth a fairly large proportion of our youth leaves school?

43. What are the best methods for the teaching of *each activity?* We are particularly lacking in literature that would guide a young

teacher in how to teach adequately the vast majority of our activities to the elementary school child.

44. Studies that attempt an evaluation of professional teaching material both as to what to teach and how to make that material meaningful seem most desirable. There are many facts, such as some of those concerning the physiology of muscular contraction, which make no difference whatever to the teacher of activities. After he has learned these facts, he may well ask, "So what?" Such facts may well be taught as background; but it would seem to me that there is a need for pulling together from each of our courses the facts *which really make a difference in the teaching of the child*. These may be in the fields of anatomy, physiology, psychology, tests and measurements, anthropometry, hygiene, and a number of other more or less theoretical fields. A great deal of material is taught in kinesiology, for example, which will never be used by ninety-nine teachers out of a hundred.

These suggested areas of research do not begin to exhaust the possibilities, but it should be encouraging to us in this relatively young and vigorous field of education, that there are many, many fertile fields thickly sown with problems of a useful and fruitful type, and awaiting cultivation. Our progress in the last twenty years has been very rapid. We should not only endeavor to continue to accelerate in professional zeal, but at the same time to refine our techniques and to become more critical of our methods and of the significance of our results.

The Field of Research in Recreation

By MARTIN H. NEUMEYER, Ph.D.
Professor of Sociology, University of Southern California

THIS introductory paper in the Recreation Research Division is designed to accomplish two things: first, to indicate the major fields and trends of research in recreation; second, to stress the importance of careful studies of needs, interests, activities, facilities, administration, and leadership as a basis for advancement in community recreation. By community recreation is meant all programs of activities provided by public, semi-public, and private departments or organizations, as contrasted with the more strictly private and individual leisure pursuits and amusements provided by commercial concerns. Since reports of studies in the various fields will be presented by other speakers, the main purpose of this introduction is to call attention briefly to types of studies made, and it is hoped that this may stimulate interest in further studies.

Serious and authoritative studies of various aspects of recreation have been made and are rapidly increasing in number, but it should be stated at the outset that while considerable progress has been made in the study of recreation, we are still far behind advances made in other fields, such as education and the social sciences. The reasons are obvious. The recreation movement is relatively new. Leaders in this field are few in number as compared with the large number of persons engaged in teaching or in social research, and most of the recreation leaders are too busy to make studies. Fortunately, educators and social scientists are beginning to consider recreation as a legitimate field for study.

Recreation covers many kinds of activities. It is nearly as broad as leisure itself. We usually think of leisure as the free time remaining after the practical necessities of life have been attended to. Most of the free-time activities are recreational in nature. We pursue them because we want to and they provide enjoyment of one type or another.

The wide scope of recreation makes it difficult to develop simplified techniques of research. Studies in recreation range all the way from systematic surveys, costing considerable sums of money, to informal investigations made by individuals during their spare time and usually at their own expense. In some of our large cities comprehensive surveys have been made of public, semi-public or private, and commercial forms of recreation. The Chicago Recreation Survey[1] is one of the most

[1] See volumes I, II, and III (1937-38). A research project sponsored jointly by the Chicago Recreation Commission and Northwestern University under the auspices of

comprehensive studies made in recent years. It covers all forms of public recreation, the historical and administrative aspects as well as the facilities and program. The study of commercial amusements includes a consideration of the scope, significance, and the methods of control. The third phase of the study deals with forms of private recreation as offered by churches, clubs, social settlements, and community centers. The investigators used the customary techniques of research—interviews, questionnaires, schedules, correspondence, observation, consultation of official reports, newspaper files, unpublished data, and previously published reports. A perusal of this survey reveals the thousands of different institutions and agencies that provide recreation and amusement in a metropolitan area.

Similar surveys have been made in other cities and metropolitan regions.[2] Usually such surveys have specific objectives in view, such as the enlargement of the playground and park program. They deal mainly with facilities and resources, and to some extent with the organization, program, and leadership of recreation. Planning commissions are particularly concerned with existing facilities and resources for future plans.

The Works Progress Administration has made considerable studies throughout the United States as a part of the recreation programs provided in various areas, showing facilities and needs, and indicating the new facilities and activities provided by leadership and resources made possible by Federal funds.

On a smaller scale, various individuals and recreation departments or school authorities have made surveys of recreation in specific areas, ranging from studies of communities to those of entire counties or even larger areas.[3]

Physical educators and recreation leaders have been interested in studying specific forms of recreation, such as the various kinds of sports and physical education activities. For instance, Springfield College reports a decade of research in aquatics, from 1929 to 1938, and records twelve master's theses, thirty-four published articles, and nine books in this field. Graduate students have studied all kinds of play activities and groups, skills of performance, and recreation interests. They have

---

the Works Progress Administration, National Youth Administration, and the Illinois Emergency Relief Administration.

[2] Compare *Cleveland Recreation Survey* (1920); *Recreation Survey of Buffalo* (1925); *Survey of Recreation Facilities of Rochester, N. Y.* (1929); "Public Recreation: A Study of Parks, Playgrounds, and Other Outdoor Recreation Facilities," in *Regional Plan of New York and Environs* (1927); *The Leisure of a People: A Report of a Recreational Survey of Indianapolis* (1929); and *Recreation Survey of St. Paul, Minnesota,* (1934).

[3] Compare Vern Landreth, *A Survey of Public Recreational Facilities in California Communities with a View of Developing Standards* (1935); Emily D. Cost, *Survey of Recreation in Fresno, California* (1936); Orland Noble, *A Survey of Recreation in Kern County, California* (1936)—all master's theses, Department of Physical Education, University of Southern California. These studies are typical of what is being done by physical education departments in universities.

tested play knowledge and have ascertained the effects of the various activities on physical growth, health, conduct, and personality. Physical educators have not only supervised such studies but have carried on or supervised more elaborate research projects.

The Social Science Research Council sponsored thirteen studies pertaining to research in the depression, of which one deals with *Recreation in the Depression,*[4] which study was made by Jesse F. Steiner. After a general consideration of recreational research problems, trends, and resources, Steiner calls attention to the recent expansion of leisure, the changing tides of recreation, leisure facilities under governmental auspices, community organization for leisure, recreation as a business enterprise, and the future of recreation.

The reduction of the working period is evidence that leisure has been expanded. Enforced leisure among the millions of unemployed during the depression is further evidence of more free time. Studies have been made of working hours, wages, labor conditions, and the leisure time programs of the unemployed. Various governmental agencies have issued reports of wide-spread leisure and what is being done to meet the situation. Nothing is more striking than the changes in methods of spending leisure. As a result of new inventions, an improved standard of living, as well as more spare time, our recreational attitudes, interests, and habits have undergone remarkable transformations. The rising tide of recreation facilities and activities during recent decades marks the beginning of a new era.

The study of *The Leisure Hours of 5000 People* by the National Recreation Association (1934) reveals not only the main leisure interests but the changes brought about by the depression. One of the most comprehensive studies of leisure in a suburban area was made in Westchester County, New York, under the direction of George Lundberg.[5] In addition to material gathered by means of questionnaires and schedules of various kinds, 2,360 diaries were gathered which recorded daily leisure activities ranging from one to seven days. This technique is especially important if we wish to get an intimate view of how people spend their spare time. Lynd's study of *Middletown in Transition* (1937), as well as his earlier study (*Middletown,* 1925), gives a cross-section of how people in a typical American city spend their leisure.

The rapid extension of governmental functions and the increasing provision of recreation facilities under governmental auspices has resulted in a series of official reports of progress. A renewed interest in community organization has stimulated many local studies.

The growth of public recreation has created a need for administrative research. The large cities and metropolitan districts have departments of recreation staffed by competent executives and specialists.

[4] See Bulletin 32, 1937, *Research Memorandum on Recreation in the Depression.*
[5] *Leisure: A Suburban Study* (1934).

Problems of financing, legislation, administrative organization, personnel selection, training and supervision of recreation leaders call for studies of one sort or another. A knowledge of income sources, the means of increasing finances, municipal recreation expenditures and budgets, and the laws necessary to obtain funds is necessary for adequate financial planning.[6] To manage a large personnel requires not only executive ability but necessitates some knowledge of administrative techniques. In cities where public recreation is administered by several departments or boards, such as playground departments, school boards, and park departments, the problem of integration and coordination looms up. As recreation leadership is more and more elevated to the status of a profession like that of teaching, the selection of well-trained persons, the training of the workers, both professional and volunteer, and the supervision of the personnel as well as the program has called for increasing studies of qualifications, experience, general education, and special training of recreation leaders.

The institutions of higher learning have endeavored to supply the talent and leadership needed. Surveys made of the types of courses offered in educational institutions and in various kinds of training institutes reveal that many new types of courses have been introduced into the curriculum of physical education and recreation. Elizabeth Cawthorne of Pomona College studied fifty-six institutions of higher learning located in the Western States. She lists twenty-three different types of courses offered by these schools. In addition to the instruction in various kinds of sports and games and in field and track events, courses are offered in the theory of recreation, organization and administration of playgrounds and other recreation centers, hygiene and first aid, club leadership, social recreation, camp leadership, nature study, dancing, dramatics, music, handcraft, and various kinds of hobbies.

One of the great needs in the field of community recreation is historical research. Clarence Rainwater made an extensive analysis of *The Play Movement in the United States* (1922), which is a good example of the study of a movement. He traced the origin, stages, transitions, and trends in the development of playgrounds. Historical studies are needed of every kind of recreation activity, of trends in community recreation, and of the evolution of leadership techniques. By way of illustration of what such studies might accomplish we may cite the game of golf. This is an ancient sport, but it has received a great impetus since the World War. The economic depression has forced curtailment of expenditures for golf but as the national income increases the demand for golf will no doubt be accelerated. What will be the likely trends? The study of trends is particularly important in view of the large expenditures for layouts and the vast acreage involved. Similar

[6] See R. O. Huus, *Financing Municipal Recreation*, 1935.

studies are needed of swimming and tennis, which are expensive sports also, particularly from the point of view of equipment.

City and regional planning includes the careful planning of parks, playgrounds, schools, and other public properties. Their location, layout, equipment, beautification, and the securing of properties for future uses are vital to the recreation program of a region.[7]

Until recently very few studies were made of commercial recreation. The Payne Foundation Studies of *Movies and Children* is an outstanding piece of research in this field. Cressey's study of the *Taxi-Dance Hall* is an example of an intensive study of a particular kind of amusement institution. The Chicago Recreation Survey includes an analysis of commercial recreation, particularly the highly organized amusement enterprises which are engaged in primarily for profit making. The regulation, licensing, and control of commercial recreation are vital public concerns. Motion pictures and theaters, ballrooms and dancing schools, billiard and bowling establishments, football and baseball, boxing and wrestling, horse racing, golf and tennis, ice sports and skating rinks, amusement parks, and many other amusement centers attract far more people than the public forms of recreation.

Most of the studies that have been mentioned thus far may be classed as surveys. The comprehensive recreation surveys include various specialized techniques, such as schedules, questionnaires, diary records, compilation of official documents, various observational methods, and cartography. The making of maps to show the ecological distribution of facilities and agencies is a common technique used in making social surveys. This device is very convenient in showing the possible relations between the facilities of recreation and such social problems as delinquency, housing conditions, and slum problems.

Two specialized devices have been used to gather data—the *questionnaire* and the *recreation interview*. The use of the former goes back to the nineteenth century. It was popularized by G. Stanley Hall and his associates. The first questionnaires used in the study of recreation were very simple and the results were of doubtful value. Monroe, for instance, simply asked, "What games do you like to play in summer, and why?" Other questionnaires have been more complex. The newer forms usually involve a check list of activities and simple questions which can be answered by yes or no. Lehman and Witty[8] used a long check list of two hundred items to ascertain the extent of participation, the play activities best liked, those consuming the greatest amount of time, and similar factors. This form was used for children. The National Recreation Association, in preparing *The Leisure Hours of 5000*

[7] See Thomas Adams, *Outline of Town and City Planning* (1935); Hubbard and Hubbard, *Our Cities Today and Tomorrow* (1929); Lee T. Hanmer, "Public Recreation," in *Regional Plan of New York and Environs* (1920); Jay B. Nash, *The Organization and Administration of Playgrounds* (1927).

[8] *The Psychology of Play Activities.*

People, used a questionnaire designed largely for adults. Grant V. Jenkins of the Los Angeles Department of Playgrounds and Recreation has made recreation interest surveys. He has constructed simplified questionnaire forms for the different age groups, such as the junior and senior high school groups, and separate forms for boys and girls. It has been felt that more accurate information can be secured by the division of the blanks into these groupings. Such questionnaires are less confusing and more usable. Questions can be answered simply by drawing a circle around yes or no. The instructions are brief and to the point.

Questionnaires enable investigators to gather a mass of information from a large number of persons in a short time; to ascertain the extent of a condition, the major recreation interests and habits of the people, and trends of development. But we must caution against the use of questionnaires. If the leaders of organizations or a group of citizens feel the need for such a study they may well ask: What is the study for? How great is the need for it? What will be done with the results? Will they be stored away or be used to plan and execute a program? Is the community in a position to do something about it if certain conditions are discovered? Does the project have the full approval and backing of the authorities who can do something about it? Do you have the money and the labor force to do an adequate job of the study? Is the questionnaire carefully prepared? Have similar questionnaires and the results obtained by them been carefully analyzed? Even though the results obtained are highly satisfactory, one must be cautious in basing a program on the replies. For instance, if the questionnaire includes questions about swimming and the study is made on a warm Southern California day, a large number may signify great interest in this sport, but during the cool late afternoon and evening hours they would show little interest.

Even the most carefully prepared questionnaire involves difficulties. Children forget some of the things they have participated in. The most recent activities and those most enjoyed are remembered best. Voting for the most favored play activity is sometimes difficult. The socially tabooed activities are usually not included, and hence no complete picture of play habits is obtained. The children studied may not be interested in the study, may be careless in answering questions, or may answer not according to their own interest and best judgment but to please the investigator or to make a favorable impression on the teacher. The difficulties of statistical tabulation and analysis are apparent to anyone who has participated in such studies.

The *recreation interview* is one of the most elaborate and accurate methods of research that has as yet been utilized in this field. The Illinois Institute of Juvenile Research has developed the most elaborate outline and schedule of questions for such an interview that has as yet been devised. This form was used extensively by the Child Welfare

Clinic of the All Nations Foundation in Los Angeles to study underprivileged children. After certain preliminary questions pertaining to age, sex, and family situation, the interviewees are asked questions about their own equipment for play, their favorite possession, and how their play equipment compares with that of their friends. This is followed by an analysis of what they do during their leisure and how much free time they have. A play test is given to ascertain their knowledge of the common forms of play. Specific questions are asked about games and sports, quiet games, street games, athletics, manual activities, collections, reading, music, art, dancing, dramatics, motion pictures and theaters, and association with friends. Many informal questions can be inserted by the interviewer as the interview proceeds.

Those who have used the interview technique attest to its great value. The success depends largely upon the art of interviewing and the cooperation received from the interviewees. Teachers and social workers, as well as recreation leaders, have found this device valuable in understanding the needs, problems, interests, habits, and potentialities of the boys and girls under their care. The drawback usually is that it takes too much time, for the extended interview usually takes about an hour. A far more complete and accurate picture of a person and his needs can be gotten in this way, however, than by means of the most elaborate questionnaire filled out by the child himself. It is, of course, possible to simplify the interview form. The cases requiring special attention can be given more time.

To be of greatest value it is desirable to use both the questionnaire and the interview techniques. Questionnaires can be used to study large numbers of people, after which a selected group can be interviewed for specific purposes. For instance, at the beginning of a school year certain basic facts pertaining to each child may be gathered by using a simple questionnaire form. During the course of the year, certain boys and girls in each grade may be more carefully studied by a series of interviews. Problem children require case studies, and the recreation interview can be made as a part of it.

Whatever recreation technique may be used, it is important to continue the studies. Cross-sectional surveys have their value, but conditions change. Hence it is necessary to continue the studies, at least periodically, in order to keep in touch with the changing situation. This requires a research staff, or at least one person in charge of research who can direct various studies, keep the records of the findings, and apply them to programs. No adequate planning is possible without continuous studies. Many of our recreation facilities simply grew, like Topsy, without a plan, and sometimes without a definite purpose.

One of the most encouraging trends in recent years is the ever increasing attention given to local areas. Community analysis and studies of organizations in local districts has been forging ahead again. The

rising tide of delinquency and other juvenile problems in certain urban areas, the lack of communal organization and coordination of agencies to meet these conditions, and the growing feeling that more accurate information is needed of the social situations out of which problems develop have given rise to a renewed interest in social studies.

The coordinating council movement has emerged in recent years with new vigor. While most of the local councils have been chiefly interested in perfecting greater integration of agencies and in attacking specific problems, numerous studies have been attempted to provide a more scientific basis for action. Some of the studies have pertained largely to the analysis of juvenile delinquency to determine the extent of the problem, the ecological distribution of cases, and the possible conditioning factors. Other studies have dealt with an analysis of existing facilities of organized group work and recreation agencies, together with special studies of the recreation interests and habits of children.

Factual material regarding community resources or the lack of them, a knowledge of the outstanding leisure-time interests and habits, and an understanding of community problems are necessary for an adequate program of recreation. The importance of fact-finding can hardly be exaggerated. City or regional planning of facilities of recreation requires careful surveys in order to obtain intimate knowledge of overlapping physical, economic, and social features and elements. To plan programs of activities, recreation executives should have accurate information concerning the needs, interests, and habits of the people, as well as of the financial resources and facilities. To administer the program requires continuous studies of leadership resources and training, techniques of administration and supervision, and detailed knowledge of trends in each particular activity.

In order to make the findings of research most useful, the facts must be accurate, they must be organized in usable form, and be at the disposal of recreation leaders. Continuous studies are essential to a progressive program. Society is dynamic, ever changing. Institutions must keep pace with changing conditions to meet the new needs of the people. Sporadic fact-finding is hardly adequate.

It must be remembered also that the public should be informed concerning the main facts. Hence, the dissemination of the findings of research is as important as the discovery of the facts themselves. Research and education must go hand in hand. No adequate planning and coordination can be successfully accomplished if knowledge of a community's needs is confined to a small group of insiders, however devoted they may be to an adequate program of recreation. Citizens also must be made aware of these needs. This requires publicity, or possibly better, effective public relations. Painstaking education is necessary to prepare people for leisure and to develop public opinion in support of a more adequate public recreation program.

It should be emphasized at this point that research in recreation, to be of greatest practical value, must be made a part of larger and more comprehensive studies of social conditions, such as the population situation, crime and delinquency rates, housing, health, conditions of employment and wages, education and religious agencies, governmental functions, public assistance, and social welfare. Community life must be visualized in its entirety. Hence frequent conferences of representatives of various agencies who have specialized knowledge of the region, be that a local area or an entire city or county, are necessary to bring together the best thought and the most complete available data.

It does not require an unusual imagination to visualize the possibilities of joint research, but it does require persistent cooperative effort to achieve them. Large business corporations would not think of launching a new enterprise without first ascertaining all the facts needed to give a reasonable assurance of success. Successful community programs of recreation, carried on by both public or by semi-public agencies, require the same kind of careful study and planning. The provision of recreation has become a big enterprise, and it has become a vital concern. In view of the rapid expansion of community recreation, as well as of commercial amusements, is it not reasonable to believe that recreation research is entering upon a new era? Necessity will demand careful studies of resources, facilities, and needs to meet the ever-increasing demand for wholesome leisure pursuits.

The Coeducational Physical Education Class Program at the College Level

By Louise S. Cobb
University of California, Berkeley

INTRODUCTION

OCCASIONALLY it happens in any well-organized group that standards and practice slowly diverge from each other when there has been no conscious or deliberate attempt to change either. The question then arises whether the standard is failing to meet a new need, or whether the practice is undesirable.

That such a situation may have arisen in the teaching of women's sports at the college level was suggested in the Supplementary Report on Coeducational Physical Education, in Dr. Eva Seen's report on "A Study of Mixed Recreation," made to this society at the annual meeting in April 1937. It was proposed in that report that since a large proportion of universities and colleges in the Western Society offered mixed programs as credit classes for men and women students, a study should be made of the whole problem. One of the several questions raised concerned the recommendations of women's standard-setting groups, that women officials, whenever possible, coach women's activities.

The present study of this problem was made possible only through the cooperation of the men and women directors, instructors, and students referred to in the following pages. The women directors were called on several times for information and deserve a very special word of appreciation for their response. Dr. Noel Keyes, Professor of Education at the University of California at Berkeley, gave valuable criticism and advice in the setting up of the questionnaire material.

THE PROBLEM

This study has been concerned only with coeducational physical education activity classes, offered for credit. Mixed *recreation* programs of any kind were entirely omitted from consideration.

An attempt was made to determine (1) the extent of the coeducational activity credit classes offered among the member institutions of the Western Society during the last three years (1936–1939), (2) cer-

This paper presents a study made for the Western Society of Departments of Physical Education for College Women. The committee members who shared generously in planning the study and in tabulating some of the results were Katherine Carlisle, Warrine Eastburn, Maxine Heiss, Ethel Mae Hill, Bertha Keller, Velda Cundiff Row, and Lucille Verhulst. They are not, however, responsible for the written report.

tain factors in the administration of such classes, (3) the opinions of men and women directors and instructors who had had experience with such classes regarding certain values and outcomes of the classes, and (4) the opinions of students enrolled in such classes during the spring semester 1939 regarding the classes.

SOURCES OF MATERIAL

The member institutions of the Western Society as of spring 1938 (excepting, of course, the women's colleges) were included in the study. A letter was sent to the chairman of the women's department describing the plan of the study and asking cooperation in it. Letters were sent to thirty-five institutions.

Twenty-seven colleges and universities replied to this letter that they had conducted coeducational credit classes and would cooperate in the study. These colleges were continued in the study. Six colleges and universities offered no such programs. Only two failed to reply.

METHOD

The questionnaire method was used to secure the data for this study. Three different questionnaires were used, as follows:

1. "Q3"—so named for convenience because it referred to paragraph three in the original letter sent to directors. This questionnaire was formulated to obtain certain factual information about the extent and administration of the coeducational program. The information could be given by one person in each institution, and was requested only of the director of the Women's Department.

2. "Q4"—so named because it referred to paragraph four of the original letter. "Q4" asked for the opinions of persons who had had experience with the coeducational class programs, about certain aspects of the programs. Whether men or women learned faster, whether differences in grading were required, whether students liked the program and profited socially by it, whether colleges should continue to offer such programs, what activities might be included, what administrative relationship of departments might be desirable—these were the kinds of questions included. "Q4" was sent to directors of the men's and women's departments in the cooperating colleges and universities, and to the men and women instructors of coeducational classes for the current year.

3. The confidential Student Questionnaire. There were two forms of this questionnaire, one for men and one for women. Students were asked their opinions about certain values of the coeducational class as compared with a class for one sex alone, what things they liked and disliked about the class, what, if any, traits of members of the opposite sex they found objectionable in the class, and what factors in the instruction seemed most helpful. It is therefore apparent why the question-

naires had to be confidential. The questionnaires were sent to instructors of these classes, with directions for having the questionnaires filled out during the class period and then collected and mailed by a student in the class.

DATA AND FINDINGS

A. Findings from "Q_3"

The following data are based on replies received from twenty-one institutions. The physical education activities offered for credit in coeducational classes during the last three years in these institutions are shown in Table I.

TABLE I

Number of Institutions in the Study Offering Coeducational Physical Education Classes for Credit in the Years Indicated*

Activity	1936–37	1937–38	1938–39
Sports			
Archery	8	9	10
Badminton	3	4	4
Canoeing	..	1	..
Diving	1	1	..
Fencing	3	4	3
Golf	6	6	7
Lifesaving	1	1	1
Riding	3	3	3
Riflery	1	1	1
Skating	1	1	1
Skiing	..	1	1
Swimming	2	..	..
Tennis	6	6	5
Winter sports	1	1	1
Dancing			
Folk	5	5	5
Modern	1	3	2
Social	4	6	8
Tap and clog	5	6	6
Other			
Recreational games and/or dancing	3	2	3
P.E. activities (low organization)	1	1	2
Individual sports	1	1	1

* The many institutions offering 2–5 classes in the same activity not indicated in this table.

It will be seen from Table I that the activities offered in coeducational classes in these institutions include fourteen different sports, four types of dancing, and three activities of a recreational or professional nature. Swimming was offered by two institutions in 1936–37 and has not been reported since. Archery is the activity that has been most frequently offered during the last three years—eight, nine, and ten institutions offered archery in coeducational classes in the three years studied. Golf and tennis follow in the field of sports, with social

and tap dancing classes somewhat more frequent than folk dancing, in the rhythmic activities. Next come badminton, fencing, and riding, followed by a sprinkling of other activities.

The universities and colleges that replied to this "Q3" were grouped as follows:

1. *State and Other Large Universities.*—Universities of Arizona, California (at Los Angeles), Southern California, Washington; Oregon State College, Stanford University, State College of Washington, Utah State Agricultural College.

2. *Smaller Colleges and State Colleges.*—Arizona State Teachers College, College of the Pacific, Fresno State, Humbolt State, Occidental, San Francisco State, Whittier.

3. *Junior Colleges.*—Compton, Los Angeles City College, Long Beach, Pasadena, Sacramento, San Francisco.

Groups 1 and 2 are made up of four-year colleges, with a two-year requirement in physical education the rule. College of the Pacific, Occidental, and Whittier have a four-year requirement, and State College of Washington three years.

All these colleges have offered at least one coeducational physical education class for credit each year from 1936–37 to the present, except as follows: Stanford 1936–37, University of Washington 1936–37, 1938–39, Los Angeles City College 1936–37, Compton Junior College 1936–37, 1937–38, Pasadena Junior College 1937–38.

Of the Group 1 colleges and universities, Utah State Agricultural College has carried on the most extensive coeducational program for the longest time. This college reported ten activities so taught in 1936–37, eleven in 1937–38, and eight in 1938–39. The University of California at Los Angeles and the University of Southern California rank next in number of activities so taught, with the former offering two, four, and six activities and the latter two, three and five for the years indicated. The remaining colleges in the group offered only one or two activities each year.

Classes were organized by the women's department in three universities, jointly by the men's and women's departments in one, and jointly for some activities and by the women's department for others in four. The women's departments have apparently taken considerable initiative in establishing the coeducational class program.

Five of these eight universities report that certain activities are offered only in coeducational classes. The chief reasons given were efficient use of staff, and desirable social contacts for students. None of these universities *require* such courses of students, except that State College of Washington requires coeducational folk dance of the physical education major students. University of Arizona and Utah State Agricultural College are the only ones that recommend such courses to

students. Utah State recommends that socially backward students enter these courses.

In replies to the questions regarding financial support of the program, provision of equipment, space, etc., and payment for breakage and repairs, this Group 1 is evenly divided (four to four) between the women's department and both departments. They are in unanimous agreement, however, that the most desirable practice would be for a provision of these items jointly by the two departments.

When we turn to Group 2—the smaller colleges and state (and teachers) colleges—there appears to be a more intensive history of physical education activity classes over this three-year period. Humbolt State has offered seven coeducational activity classes in each of the three years, College of the Pacific six, Arizona State Teachers College five, Occidental five, four, and three, San Francisco State three, Fresno State two, three, and three, and only at Whittier does the number of activities a year drop to two, one, and one.

In three colleges the classes are organized jointly (by the men's and women's departments), and in the other colleges some activities are organized jointly and some by the women's department. Occidental was the only college reporting any classes organized by the men's department alone. Golf and fencing are so organized at Occidental.

Five of these colleges in Group 2 offer certain activities in coeducational classes only. The reasons given were chiefly efficient use of teaching staff, and interest and social values to students. None of these colleges requires coeducational physical education of all students, but five require certain activities of major students. It was variously stated that these students could learn some of the required activities in no other way and that they needed to appreciate the teaching problems of the opposite sex in preparation for teaching both boys and girls, etc.

Four of these seven colleges recommend coeducational physical education classes to certain students: to those needing the social contacts, to students whose programs are restricted, or to major students planning to teach at the elementary level.

In this group of colleges the administrative items—financial support, equipment, space etc.—are consistently supplied jointly by the two departments, with one exception. At San Francisco State the financial support of the program and the equipment are provided by the women's department. These colleges again agree that the most desirable administrative practice is for the two departments to share in providing all the items included in the question.

The junior colleges included in Group 3 have an enrollment of from 2,000 to 6,000 students each. They are therefore considerably larger than most of the colleges in Group 2. Their problems may, for this as well as other reasons, be rather different from the four-year colleges.

These facts should be kept in mind in considering the following findings.

San Francisco is the only one of the Junior Colleges reporting more than one or two coeducational activities in any year from 1936–37 to the present. San Francisco reported four, four, and five for the respective years under consideration. No coeducational physical education activities were offered by several of these junior colleges, as follows: Compton 1936–37, 1937–38, Pasadena 1937–38, Los Angeles City College 1936–37.

Most of the activities were organized by the women's department, although several were offered jointly. Long Beach reported only a joint organization.

Four junior colleges offered certain activities in coeducational classes only. In two cases the activity was social dancing. None of these colleges requires any coeducational activity of any student. Four of the six schools, however, recommend the classes to certain students—usually students needing social experience and poise.

Administrative provision for the program is equally divided between the junior colleges in which the women's department and those in which both departments have taken the responsibility. The women directors in these colleges are unanimously agreed that the administrative responsibility should be shared by both departments.

B. Findings from "Q4"

As stated above, this questionnaire was sent to men and women directors and to the instructors of coeducational classes in the cooperating colleges. Twenty-four institutions were included, and replies were received from twenty-two, distributed as shown in Table II.

TABLE II

Distribution of "Q4" Returns*

Respondents	Number Questionnaires Sent	Number Questionnaires Returned	Per Cent of Returns
Women directors†	24	22	92
Women instructors only (see above)	26	23	88
Men directors‡	21	9	43
Men instructors (see above)	18	13	72
Total	89	67	75

* Three unsigned, unidentifiable questionnaires not included.
† Includes seven who also teach coeducational classes.
‡ Includes five who also teach coeducational classes. Four additional men directors acknowledged receipt of the questionnaire, and explained their inability to fill it out.

The questionnaire is divided into two parts. Part I includes Sections A and B, and Part II includes Section C. The Section C replies were confidential. They were detached by the chairman, as agreed, and were seen by no one else. In Tables III, IV, and V may be found a

summary of the replies to the three sections of "Q4." It will be noted that not all sixty-seven respondents answered all questions, so the totals are not identical. It seems likely that replies were made only to those questions on which the writer felt a reasonable assurance about the question. A few of the facts brought out by the tables follow:

TABLE III

RETURNS FROM SECTION A OF "Q4" AS CHECKED BY MEN AND WOMEN DIRECTING AND TEACHING COEDUCATIONAL CLASSES

A. From your experience with these classes, will you check (√) or fill in the appropriate space below:

Statements regarding learning of activities in coeducational classes	Men	Women	Neither
1. Skill in the activity is usually developed faster by	21	5	11
2. Skill is generally developed faster in coeducational class than in class for one sex alone, by ..	8	27	24
3. Skill is generally developed more slowly in coeducational class than in class for one sex alone, by	17	5	22
4. Grading of skill must be stricter in the case of	9	2	32
5. Knowledge, as shown in written tests on rules, techniques, etc., is *more* extensive and thorough in coeducational class than in class for one sex alone, in the case of	6	7	32
6. Knowledge (as above) is *less* thorough in coeducational class than in class for one sex alone, in the case of	4	4	27

In Table III, questions A1, 2, 3 on rate of learning physical education activities by men and by women: The majority opinion expressed was that men ordinarily learn these activities faster than women. In coeducational classes, however, women were thought to learn *faster* than in classes for women alone, although 40 per cent of those voting thought there was no sex difference in this respect. Men were thought to learn *more slowly* than in classes for men alone where there was a sex difference expressed, although 50 per cent of those answering this question believed there was no such difference here.

Question A4 on grading: A few replies indicated that men must be graded according to a stricter standard than women in these classes, although the great majority of replies indicated no difference in grading standards.

Question A5 and 6 on knowledge tests in the activities: The replies were quite consistent in claiming no sex difference here. With one exception, the few differences noted were expressed by women directors or instructors.

In Table IV, question B1 on student preference for coeducational class or traditional type class: Of those replying, forty-eight stated

that students like a coeducational physical education class better than or as well as a class for one sex alone, and twelve were not sure. One person was sure and two not sure that students like the classes less well than a class for one sex alone. The meaning of the two "no" votes on all three statements is obscure, since they were so voted by two people who failed to select one of the statements as requested.

Question B2 on the theoretical values of the coeducational class: There was practically unanimous agreement that the values of such

TABLE IV

RETURNS FROM SECTION B OF "Q4" AS CHECKED BY MEN AND WOMEN DIRECTING AND TEACHING COEDUCATIONAL CLASSES

B. From your experience with these classes, will you check (V) and answer the following questions relating to values and outcomes to the student other than actual skill and knowledge of the activity.

Question	Yes	Not Sure	No
1. Do students like coeducational physical education			
Better than a class for one sex alone	34	9	2
As well as a class for one sex alone	14	3	2
Less well than a class for one sex alone	1	2	2
2. Do the values of a coeducational physical education class theoretically include the following:			
a) Making friends of the opposite sex through class	59	0	1
b) Gaining confidence in mingling more easily with people of opposite sex	58	2	1
c) Finding more opportunities for recreational sports (or dancing) with opposite sex	56	5	1
3. Do you find that these values are actually attained in your coeducational classes:			
a) Making friends of the opposite sex through class	59	1	1
b) Gaining confidence in mingling more easily with people of opposite sex	49	8	1
c) Finding more opportunities for recreational sports (or dancing) with opposite sex	46	9	1
4. Are the social values of these classes great enough to justify offering coeducational activity classes?	53	4	4
5. Were there any traits of the *men* students that would have made the *women* enjoy participating in the class more?	5	2	1
a) Manners	18	4	
b) Costume	6	7	
c) Personal cleanliness	11	4	
d) Other	7	2	
6. Were there any traits of the *women* students that would have made the *men* enjoy participating in the class more?	5	3	5
a) Manners	16	5	9
b) Costume	12	6	8
c) Personal cleanliness	8	7	8
d) Other	8	3	5

classes include (*a*) making friends of the opposite sex through class, (*b*) gaining confidence in mingling more easily with people of the opposite sex, and (*c*) finding more opportunities for recreational sports or dancing with the opposite sex.

Question B3 on whether these values are actually attained: Only one person replied in the negative, but a greater majority of men than of women checked "not sure."

Question B4 on whether the social values of these classes were great enough to justify offering them for that reason alone: There was a clear-cut "yes" vote of the entire group on this question, although there was a light sprinkling of negative and "not sure" votes.

Questions B5 and 6 on opinions regarding traits, etc. that men and women found objectionable in each other: There was a small proportion of answers to these questions. This may probably quite fairly be taken to mean that few objections were noted. "Manners" were checked for the largest number of objections in both groups with "personal cleanliness" and "costume" next. This, if borne out by the returns on the student questionnaires, would indicate a possible field of activity for the teacher of these classes.

In Table V, questions C1*a* and 2*a* on the question whether colleges should continue to offer coeducational physical education classes: All but three of the sixty-seven respondents voted that these classes should be continued. Two men directors and one woman director voted no. Of the reasons listed for continuing the coeducational program fewest votes were given to "Students learn better in these classes," and the largest number of votes to "Students develop desirable social qualities." The rating of other reasons may be seen in the table.

Question 1*b* on activities suitable for a coeducational program: Handball, squash, and water polo had fewest recommendations, although they had some. Several people noted the omission of swimming from the list of activities, and added it. With the substantial vote favoring lifesaving, swimming would probably have rated very high if it had been included. The activities most frequently recommended were social dancing, riding, and archery, with badminton, folk dancing, and skating following closely.

Question C3 on the most desirable administrative relationship of the men's and women's departments (in view of increasing cooperation in coeducational activity program, etc.): The women directors in the small colleges and junior colleges are almost unanimously in favor of "Two separate departments cooperating in certain phases of the work." The majority of women directors in the universities favor at least theoretically "a single department with either a competent man or a competent woman in charge." Three women added a statement that there should be a subhead in charge of each department. With the women instructors, the vote was 16 to 7 for "two departments

cooperating" and "a single department with competent man or woman at head" respectively. The men directors were almost evenly divided over the two plans. The men instructors strongly favored the "two cooperating departments." There were two and one-half votes from the entire group for "Two separate departments, one handling all the work for men, and one handling all the work for women."

The reasons given for these choices were often the same, even when the choices were different. The need for better cooperation between

TABLE V

RETURNS FROM SECTION C OF "Q4" AS CHECKED BY MEN AND WOMEN DIRECTING AND TEACHING COEDUCATIONAL CLASSES

C. This section of the questionnaire will be detached by the chairman of the committee, and the replies treated confidentially. They will simply be summarized without identification to give a complete picture of the status of coeducational physical education in the colleges of the Western Society.

1. Is it desirable that colleges continue to offer coeducational physical education classes? .....Yes (64) No (3)

a) If yes, check (√) reasons below:

Students learn better in these classes .....(11)
Students learn as well in these classes as in others .....(38)
Men and women learn respect and consideration for each other's strength and skill .....(54)
Students develop desirable social qualities .....(59)
Students develop standards of taste in dress, manners, etc. .....(49)
Classes often help students in mental health adjustment .....(43)
Helps develop closer cooperation between men's and women's departments .....(47)
Administrative problem of scheduling small groups in two departments solved .....(29)
More variety of program possible .....(43)
Specialists in one department at service of other department....(51)
No valid reason to oppose it .....(27)

b) Check (√) any of the following activities that seem to you suitable for coeducational instruction:

Archery	(62)	Lifesaving	(33)	Tap dancing	(48)
Badminton	(61)	Modern dancing	(51)	Tennis	(55)
Bowling	(56)	Riding	(65)	Water polo	(4)
Diving	(39)	Skating	(60)	Volleyball	(38)
Fencing	(34)	Skiing	(57)		
Folk dancing	(61)	Social dancing	(66)		
Golf	(55)	Softball	(10)		
Handball	(7)	Squash	(8)		

2. Is it *undesirable* that colleges continue to offer coeducational physical education classes. (See under C1 above.)

3. What is the most desirable administrative relationship of the men's and women's departments: (See text.)

Two separate departments, one handling all the work for men, and one handling all the work for women.
Two separate departments cooperating in certain phases of the program.
A single department with a man at the head.
A single department with a woman at the head.
A single department with either a competent man or a competent woman at the head.

departments, for more efficient use of facilities and equipment and for varied program, and the administrative soundness of a single department, were all cited. On the other hand, the different problems that arise in men's and in women's work, the difference often found in the training of the men and women faculty members, and the differences in standards often encountered, were also pointed out. The small colleges and the junior colleges seem very solidly determined on the two department plan. The stress on the men's intercollegiate program in the colleges of these two groups was frequently mentioned. It apparently colors the physical education situation in these institutions in a way that should not be overlooked. Since there is a difference in the opinion of the men and the women directors in the larger universities toward a combined department, the question arises whether on the whole there is a different type of leadership among the men in those institutions where the director is not perhaps immediately in charge of the intercollegiate program.

C. Findings from Student Questionnaires

A total of 2,112 student questionnaires was filled out and returned for this study. The replies have come from students in nearly all the types of sport and dance classes listed in Table I above, and in the various types of institutions. The questionnaires were filled out during the class period and collected and mailed by a student, in order to assure frank replies.

Question 1, on the student's reason for entering the class: "Interest in the activity" is overwhelmingly in the lead. "Schedule convenience" lags way behind in second place. Few students claim to have taken the course in order to meet the students of the opposite sex, to develop self-confidence, because they prefer mixed groups, or because of any requirement.

Questions 2 and 3 on whether the student liked or disliked the class: Here again the students voted overwhelmingly that they liked the coeducational class. A very small proportion say they dislike it. The reasons most frequently given for liking the class are "interest in the activity," "developed skill in the activity," and "congenial and friendly class group." Most frequent reasons for disliking the class were "not enough instruction," "insufficient facilities," "boring," etc.

Question 4 on liking the class: Few students said that they liked the coeducational class less well than a class for one sex alone. The votes were somewhat heavier for liking the class "better than" the traditional class than for liking it "as well as" the traditional class.

Question 5 asked whether they learned as much in the coeducational class. The answers were consistently "Yes."

Questions 6, 7, and 8 brought out wide individual differences of response. The answers indicate that a large number of students did

make friends of the opposite sex (from 1-30 were reported), and that they did gain confidence in mingling more easily with people of the opposite sex, but that the majority probably do not now seek or find more opportunities for recreational sports or dancing with the opposite sex. The students may, however, seek such opportunities now that the course is ended, although the questionaire does not answer this question.

Question 9 asks whether they would choose a coeducational class again in preference to a class for one sex alone. Apparently the majority, although not an overwhelming majority, would.

Question 10 asked about traits of students of the opposite sex in the class. Most objection raised by both men and women was to the manners of the opposite sex. Men think the women "officious" and "snooty" and object to their laughing and talking so loudly—when they object at all, which is infrequent. There were comparatively few objections to the costume and personal cleanliness of the class members of the opposite sex, although personal cleanliness received more unfavorable votes than costume. There would seem to be an area here for adult leadership.

Questions 11 and 12 on instructor's qualities: If the instructor knows the activity thoroughly, is fair to men and women alike and pays attention to unskilled as well as to skilled students, the students apparently appreciate this. In Question 12, the question was asked "What, if any, additional things could the instructor have done to make the class more interesting." More students suggested "more instruction" and "more individual attention" than any other things. Occasionally a series of similar criticisms from students in the same class seemed to indicate that a teacher was thought to favor the men students or the women students or her sorority sisters, or that she did not give much instruction. These criticisms may be true in any kind of class as well as in a coeducational class. It probably is wise for all teachers to "take stock" of these things from time to time. Even if the criticisms are untrue, it is very bad mental hygiene for the class if any considerable number of students think they are true.

CONCLUSION

This study of coeducational physical education classes based on the experience of the majority of the member institutions of the Western Society, and on the opinions of men and women directors, instructors, and students in these institutions, indicates (1) that this type of program is quite widely carried on in these institutions, (2) that a wide variety of athletic * and dance activities is used, (3) that men

* Chiefly individual and dual activities, although softball and volleyball are frequently recommended.

and women directors, instructors, and students regard the classes as valuable and wish to see them continued, and (4) that the majority of men and women directors and instructors favor an administrative relationship of two distinct but cooperating departments. The need for increasing inter-departmental cooperation was frequently written in on the questionnaires.

In closing, the suggestion is submitted that our colleges and universities proceed with plans for coeducational physical education classes for credit on the basis of the particular needs and problems in each institution. An expansion of the mixed recreation program with few if any of these coeducational credit classes might conceivably be the most effective method of attaining the values of the present coeducational credit classes in some institutions. However that may be, this recent development in physical education at the college level deserves our careful consideration for its most lasting and worthy contribution to the total program.

Specific Diets and Athletic Fitness: A Preliminary Investigation

By George Z. Dupain
New South Wales, Australia

INTRODUCTION

MUSCULAR tissue is ubiquitous in the organic world. We cannot speak, move an eye, or write a word without contractile tissue functioning. Even when we count mentally, the muscles of the tongue and larynx make movements.[1]* In the jungle of mental processes, thought escapes and bodily movement manifests itself. There is no such thing as a separated mental or physical condition. Man is a unity. Mental phenomena are qualified by bodily processes, and vice versa.

Muscles obtain their energy of motion from the combustion of substances supplied by the food. The end-point of a series of complicated biochemical changes within the muscle is the production of CO_2. Muscles take in oxygen and give off CO_2. They also have the power to accumulate a store of energy akin to an electrical battery. Muscular energy is released by a chemical breakdown of two substances. What actually takes place is still more or less a mystery, but something about the process is known.

There are two main substances involved at the outset—glycogen and phosphagen. Glycogen is a multiple sugar, and phosphagen is a compound of creatine and phosphoric acid. When a muscle works, whether it be in a mammalian body or in the laboratory separated from a body, glycogen breaks down into lactic acid, and phosphagen breaks down into creatine and phosphoric acid compounds. The glycogen-lactic-acid system seems to be of greater value in vigorous types of activity, while the phosphagen system functions in mild types of activity.

In the first stages of intensive muscular action, oxygen is not used. Contractions are said to be anaerobic, until at least the body adjusts itself to the new conditions.[2, 3] A typical instance of anaerobic contraction is the 100-yard sprint. The muscles are in a state of intense activity and the subject does not breathe (use oxygen) until the action is over. Laboratory research also indicates that a muscle will contract in an atmosphere of nitrogen. But as soon as such contractions have finished, oxygen is needed to restore equilibrium, and "wind up" the machine for further use. An athlete may contract an "oxygen debt"

* Refer to numbered Bibliography at end of article.

in order to do a fast piece of work, and pay off this debt at the end of the feat. For instance, in a fast 2-minute run, an athlete may pile up an oxygen debt of 10 liters, which may take from 10 to 30 minutes of vigorous breathing to pay off when the exercise is finished. Indeed Dill[8] has shown that an athlete may not completely recover from a severe effort for 30 hours afterwards. This does not mean that he is still breathing in a laborious manner, but rather that there are still signs of physiological disequilibrium.

The highly trained athlete can run up a greater oxygen debt than the untrained man. But it must be remembered that even though the athlete's blood is able to hold a higher oxygen concentration, the heart is unable to deliver this oxygenated blood fast enough for the muscular tissue to utilize when it is undergoing active exercise. The normal lung spaces do not give out; they provide all the oxygen necessary, but the onus of the task is on the heart, and the cardiac machinery is not so perfect that it can give the tissues all they want in the short time they want it.

The fuel supply for all bodily energy is obtained from the food we eat. This is broken down from the crude form into finer molecular units and absorbed through the intestinal walls. The small intestine is virtually the governor of nutrition.

It is known that muscular tissue when undergoing vigorous activity selects glucose in preference to protein or fat. Dill[4] has shown that a normally fed individual has a reserve of about five hundred grams of carbohydrates. If such an individual works for about eight hours without food, all his carbohydrate supply is used. "During the first hours of the working day the subject uses about five-sixths carbohydrate and one-sixth fat. Doing the same work at the end of the day he is using one-sixth carbohydrates and five-sixths fat. He quits from exhaustion with an ample reserve of fat but almost no reserve of carbohydrates . . . his blood sugar has dropped to two-thirds the normal level, and recovery is coincident with return to normal blood sugar levels after eating."

Haggard and Greenberg[5] have shown the intimate relationship between diet and physical efficiency, and particularly the effectiveness of sugar feeding in muscular work. Krogh and Lindhard[6] as far back as 1920 showed that muscular work was performed about 10 per cent more effectively and economically upon a diet containing an excess of carbohydrates.

Christensen, Krogh, and Lindhard[7] have further shown that in maximal work, not only do the muscles select carbohydrates for fuel, but the carbohydrate stores must be stocked plentifully before engaging in extreme muscular work. Conceptions regarding the fuel of muscular work have wavered from the time of Chauveau (1896) to that of Hill (1926), but there is a general conception among modern workers

that in moderate exercise, proteins, fats, and sugars are metabolized just as they are when one is resting; but in *maximal* work, a diet rich in sugars is favorable; and that the muscle engines work best when there is a plethora of sugars stored in the body.

PROCEDURE

Specific dieting is a problem in any form of athletic training.[10, 11, 12] In my own experience, I have found the following dietary schedule effective when applied to long-distance cyclists and runners. Most of these men have been the short, pyknosome types, and they have trained very strenuously for their events, which have been from 3- to 10-mile runs, and in the case of cyclists, 150 miles. Training commences from 3 to 6 months before the event, in a general, easy way. The ordinary diet of these athletes is always checked up to find out if there are any deficient factors. Very frequently these are found in the shape of deficient iron and calcium, and more often badly balanced in respect to the three calorigenic foods, proteins, fats, and carbohydrates. These defects are altered. Then during the first month's training an extra quantity of sugar is administered (about 50 grams daily as barley sugar) without making any other alterations in the diet.

Additional iron is then given in the form of raisins, parsley, and spinach, which is worked into the feeding plans. Vitamins B^9 and C are then increased by marmite (a yeast preparation), citrous fruits, and sometimes special doses of cevitamic acid. Every 7 days there is a resting period lasting sometimes 2 days in which the sugar intake is doubled for this 48-hour period. Sometimes this brings the intake to over 1000 grams. During this stoking-up period, I have found that some persons cannot tolerate this extra burden of sugar, even though it is administered in 20 per cent doses. One 3-mile runner especially was so sick (nausea and vomiting) at even these resting epochs that his extra sugar intake had to be curtailed. There was no other factor responsible except excessive sugar ingestion, for as soon as this was reduced he got quite well.

Urinary examination showed that there was no glycosuria. This was not due to lack of protein or fat balance, but probably was the result of a *low toleration limit*. The storage capacity of muscles and liver was low. This man was thin and always lost weight when he trained down to "good form." His toleration limit seemed to be about 600 grams per day.

When "all-out" training is commenced, resting periods of 2 to 3 days in 8 or 10 are instituted in which proteins are cut down a little, and fats and sugars increased, maintaining a quantitative ratio of about 1.5 fat to 8 or more sugar. This scheme is continued right up to 3 or 4 days before the athletic event. Urinalysis is conducted to check up carbohydrate toleration.

In the case of cyclists and runners, the type of dietary plan which is shown below is more or less in existence one month before the athletic event. During the long cycling trek milk containing extra glucose is always recommended. This is carried and drunk at various stages on the road.

Quantities are worked out to give about 100 grams protein, 150 to 200 grams fat, and from 600 to 800 grams carbohydrates. Calcium averages out about 2 grams, phosphorus 4 grams, and iron .03 grams per day. Even though carbohydrates are worked up to over 1000 grams per 24 hours during resting epochs, some of the trainees can easily take this amount daily without inconvenience. Each daily diet yields about 4500 to 5500 calories during the training period. In the case of the 6 cyclists, weight was steadily maintained and systematic urine analyses did not show any albumen or sugar.

These men trained regularly according to their own schedule, and I did not interfere with these plans in any way. My objective was to note the effects of dietary changes and collect all the data I could in this respect.

DISCUSSION AND DATA

It is difficult to collect scientific data at any cycling road race in Australia. Trainers and coaches are not interested in scientific investigation, and are inclined to resent any intruders who seek to solve some of the problems of exercise physiology. *Thus, some of the data collected depended on the testimony of the racers themselves.*

Six cyclists and two long-distance runners engaged my services as dietetic adviser. I was not asked to outline any "conditioning" method. They were left to their own traditional methods of training for the contest. It was agreed that such training should not alter, but continue as was customary. My duty was to give them a power-capacity diet and my objective to see how such and such a dietary plan worked.

In the case of the cyclists and the runners, the basic diet was as shown on the opposite page.

No supper was allowed except perhaps a light ale or a cup of hot milk. When extremely thirsty through excessive sweating, isotonic salt solution (1 cup) was taken.

This was the basic diet yielding about little over 100 grams protein, about 150 grams fat, and over 700 grams carbohydrates with about 2 grams calcium, 3 grams phosphorus, and about .03 grams iron. This latter was added to by iron preparations when needed, and water was imbibed as liquid, up to 8 or more glasses per day. Changes were made from time to time in meats, vegetables, and sweets for the sake of palatibility.

The training diet adopted for *speed work* consisted of about 210 grams protein, consisting mostly of meat, 100 to 130 grams fat, and

350 to 400 grams carbohydrates. There were adequate calcium, phosphorus, iron, and vitamins in this preparation.

The basic diet definitely increased endurance and general fitness. Especially in the case of 2 cyclists did this plan work wonders. They rode the whole distance from Goulburn to Sydney, 150 miles, without any break or undue stoppage, and finished comparatively fresh. They stepped off their machines, had a "feed," and retired. Such a thing had never happened before in their racing history, which covered a period of about six years.

THE TRAINING DIET ADOPTED FOR ENDURANCE ATHLETES

Food	Kitchen Weight	Analysis
Breakfast		
Eggs	One	This meal yields about:
Bread (80% fine wholemeal)	3 slices	
Butter	2 tsps.	30 grams protein
Marmite (yeastfood)	Scraping	40 grams fat
Milk	1 Cup	150 grams carbohydrates
Toast (wholemeal bread)	1 sl.	.3928 grams calcium
Butter	1 tsp.	1.3433 grams phosphorus
Honey (candied)	1 tbsp.	.0038 grams iron
Apple or pear	One	
11 A.M.		
Milk	1 C.	This snack gives about 8 grams protein, 9 grams fat, 42 grams carbohydrates, a little calcium, phosphorus and iron.
Barley Sugar	1 oz.	
Dinner		
Meat	4 ozs. (about)	This meal yields about:
Potatoes with parsley	2 large	
Cabbage	3 tbsps.	40 grams protein
Carrots	2 medium	80 grams fat
Lettuce or spinach	6 leaves	300 grams carbohydrates
Orange	One	.30618 grams calcium
Any sweet pudding (raisins)	Large helping	.5057 grams phosphorus
		.0186 grams iron
Afternoon		
Milk	1 C.	This snack gives about:
Hoflicks	2 tsp.	10 grams protein
Barley Sugar	2 ozs.	10 grams fat
		80 grams carbohydrates
		Some calcium, phosphorus and iron.
Evening Meal		
Cheese	2 cubic ins.	This meal yields about:
Potatoes with lettuce and parsley	1 large pot.	30 grams protein
Bread (w.m.)	1 sl.	60 grams fat
Butter	1 tsp.	110 grams carbohydrates
Honey	1 tbsp.	.8598 grams calcium
Milk coffee	1 C.	1.6333 grams phosphorus
		.0052 grams iron

An interesting point to note was the absence of post-racing fatigue. Under the old dietary regime, their fatigue was so acute that they almost collapsed at the finishing point, and for two days afterwards they were so "dopy" that they just "mooned" about, doing nothing. After one contest, one man went to bed for two days to recover. Under the improved dietary supervision, no muscle stiffness or cramp was experienced, no signs of tiredness, and they *actually cycled back to their homes the following day* (a distance of over 100 miles).

The other four cyclists testified to similar experiences, but were not so experienced roadsmen, and met with mishaps which cut down their time. *They were enthusiastic, however, about the "change" in their condition.* They definitely increased their time between certain stations.

The traditional diet of these men was excessive meat, tea, white bread, butter, oatmeal porridge and sugar, potatoes, and tinned fruit, and they had never made good in long-distance contests. This diet was completely unbalanced with respect to calorigenic complexes, and was definitely deficient in vitamin B and C and calcium. They had consumed a lot of underdone meat, being informed that this gave great enduring power. They were workers in the country towns, and their coaches were not very conversant with the dietetic side of training. These cyclists were attempting to do endurance feats on a high meat diet. They were eating 3 meat meals per day, and in some cases had consumed 3 lbs. of meat within 10 hours.

At one period during a long-distance training try-out (before my dietetic scheme had been in use) one of the men was attacked by quadriceps-cramp. When he jumped off his bicycle at the finish both legs shot out straight into an extended position and he could not bend them. He writhed in agony until warmth and gentle massage relaxed his quadriceps. I attributed this to some dietary deficiency, possibly lack of calcium ions. Adequate vitamin D must have been present, because these men were sun-tanned and always trained stripped to the waist. The diet, however, proved to be definitely low in calcium.

Now, unbeknown to me, one of these four men, disappointed with his efforts in long-distance racing, decided to specialize in the mile and 2-mile cycling sprint. He maintained the dietary schedule that I had mapped out for *endurance,* and altered his training for speed work. But he could not finish better than in seventh to tenth place. On consulting me again, I switched him over to a high meat diet on the basis of 210 grams protein, 100 grams fat, and about 400 grams carbohydrates. In other words, a high protein, low fat-carbohydrate diet. Whatever happened, his "form" changed and he came in 2nd in six successive races within 2 weeks. He could not understand this, and was "tickled to death" by his increase in kick-off and speed.

Not one of these 6 cyclists, over a course of years, had any success in long-distance road racing. Indeed, their place in 50 competitors had never been more than near the 20th man in. In one 150-mile race, four of them did not reach the 80-mile stage, and the other two had come in with the stragglers. The only alteration in their regime this year was their diet. There is no doubt in my mind that under the old dietary regime their energy was quickly dissipated, *although they had felt that they were all right at the start of the race.* In addition to this, they were allowed to smoke and drink large quantities of beer when extremely thirsty.

The 3-mile runner used to train for his contest on a diet low in carbohydrates and high in protein and fat. He frequently had attacks of "indigestion," which I think was due to excess of fatty foods. This appeared to me, however, more like a temporary ketosis. His improvement was well marked under the new regime and he was able to cut 10⅕ seconds from his time.

The 10-miler was not a world beater by any means, and he did not improve his time in the one race which I dieted him for, but there is one noticeable feature worth recording. He had run 10-mile races for three seasons, and at the end of every race he "used to heave his heart up" as he expressed it. On this latter occasion he was not sick at all, and recovered almost immediately after the race. His previous diet was high in protein and fat and low in sugar. His trainer had cut out all sweet puddings, cakes, and sugars.

CRITICISMS, SUGGESTIONS AND SUMMARY

Eight well trained athletes were subjected to changes in dietary plans in order to find out if any increases in speed or endurance could be registered by this means. Actual training plans were not altered. Improved results occurred in all cases.

It must be admitted that the data are scanty, and there is absence of mathematical material. In addition, the number of subjects is small, thus invalidating to some extent the "armour of proof." Yet I am positive that certain dietary alterations produced increased physical capacity. These young men were strong and vigorous, and had trained for years, but there was no other factor at any time which produced such extensive changes. The argument that *any kind of diet* will do the same thing provided correct training is applied, is pure sophistry.

I submit the theme for further validity that a diet high in fat, excessive in carbohydrates, and low in protein with *adequate vitamins and minerals* increases endurance and sustaining qualities, while a diet low in fat and sugar and high in meat protein, with adequate minerals and vitamins, increases muscular speed and kick-off, but does not favor long-distance work or endurance tests.

The problem of feeding the carbohydrate furnace during maximal

activity depends upon adequate storage supplies, and I am convinced that such a dietary plan as I have inaugurated performs this function. It appears to me that the individual can be trained dietetically to increase this storage capacity.

I am carrying on further investigations with long-distance athletes for the purpose of collecting data more of a mathematical character to validate the above.

BIBLIOGRAPHY

1. James, William, *Principles of Psychology,* Vol. I, Chaps. 1 and 2.
2. Needham, D. M., "Chemical Cycles in Muscular Contraction," *Perspectives in Biochemistry* (Cambridge University Press, 1938) p. 201.
3. Holmes, Eric, *The Metabolism of Living Tissues* (Cambridge University Press, 1937) p. 119.
4. Dill, D. B., "A Measure of Health. The Capacity of an Individual for Work." In *Interpretations of Physical Education,* J. B. Nash, Ed. (New York: A. S. Barnes and Co., 1933) Vol. IV, pp. 29–34.
5. Haggard and Greenberg, *Diet and Physical Efficiency* (Yale University Press, 1935).
6. Krogh and Lindhard, "The Relative Value of Fat and Carbohydrates as Sources of Muscular Energy," *Biochem. Jour.,* 14 (1920) 290–363.
7. Christensen, Krogh, and Lindhard, *Quarterly Bulletin, League of Nations* (Sept. 1934).
8. Dill, D. B., "The Economy of Muscular Exercise," *Physiol Rev.,* 16:2 (1936) 263–291.
9. Cowgill, George R., *The Vitamin B Requirements of Man* (Yale University Press, 1934).
10. Frey and Dubois, "Aperçus concernant les échanges nutritifs dans l'effort physique," *Nutrition,* 5:4 (1935) 375–398.
11. Lusk, Graham, *The Elements of the Science of Nutrition* (1928) esp. pp. 400–446.
12. Hutchison and Mottram, *Food and the Principles of Dietetics* (Edward Arnold and Co., 1933) esp. pp. 57–63.

Some Differences in Bodily Proportions between American Negro and White Male College Students as Related to Athletic Performance

By Eleanor Metheny
State University of Iowa

During the last few years, as a number of American Negro athletes have come into prominence, particularly in track and field competition, coaches and sports enthusiasts have raised the question: Is there some difference between Negroes and whites in proportions of the body which gives the Negro an advantage in certain types of athletic performance? There has been much speculation concerning this question, but so far as we have been able to determine, no one has attempted to answer it quantitatively. This paper presents certain anthropometric data on American Negro and white male college students. In Part I these data are analyzed with respect to racial differences of interest to the physical anthropologist. In Part II these differences are discussed with respect to their theoretical kinesiological implications for athletic performance.

PART I

There have been relatively few studies of the bodily proportions of the young adult American Negro. As a by-product of the measurements taken in the Army during and at the end of the World War came the first large series of measurements on the adult male Negro in America. Davenport and Love[4]* reported a series of measurements on 6,441 Negroes of all degrees of racial mixture and compared them with those taken on 96,596 white soldiers. In 1928, Hrdlicka [9] published his observations on full-blood Negroes in Washington, D.C., but because of the severity of his criterion, his male series was limited to 20 cases. In the same year, two studies[12, 13] appeared from the Western Reserve Laboratory based upon the measurements of 100 Negro and 100 white cadavera. And also in the same year, Herskovits[6] stated that "from as diverse racial stocks as it is humanly possible to assemble—Caucasian, Negro and Mongoloid—has come a type which is homogeneous and little variable—a veritable New Negro, the American Negro." [6, p.33] In 1930 and 1931, Herskovits and his associates[7, 8] published more complete information concerning the data upon which his

* Refer to numbered Bibliography at the end of this article.

earlier study had been based, which included a series of 475 Negroes from Howard University, 156 Negroes from the deep South, and 887 Negroes of his "general" series, which included several smaller groups. In 1934, the findings of these investigators were carefully summarized by Cobb, and a composite picture of the American Negro was drawn, showing that the American Negro differs from the white chiefly in "proportions of limbs and torso and cranial architectural pattern." [2, p.387]

These, then, constitute the major available sources for our information concerning the physical type of the American Negro. The specific findings of each investigator which are pertinent to the present study are commented on below, as are the findings of certain other studies of limited interest.[1,3,5,11]

In 1937, when anthropometric measurements were being made on a large number of college students at the State University of Iowa,* measurements were obtained on the 51 male Negro students attending the University. Since these students came, in general, from the middle western states, an area which has not been extensively studied by anthropologists interested in the American Negro it was felt that these 51 cases might represent a contribution to the information at present available about the American Negro. Consequently, these measurements were carefully analyzed and compared with a similar group of measurements on white students, and the results are here presented.

All measurements were taken by two carefully trained graduate students. The subjects were measured nude, using the techniques described below. It was not feasible to obtain histories of possible mixture of ancestry from the Negro students, and no attempt was made to determine degree of mixture by any objective method. However, if we accept Herskovits' statement to the effect that the American Negro is becoming or has become a stable type, the lack of information concerning ancestry should not invalidate the findings. They are, in all probability, as homogeneous a group as the white students, whose ancestors, early or recent, have included many nationalities. No attempt was made to investigate the socio-economic level of the two groups, but it is believed that they are at least roughly comparable, since all of the subjects had sufficient means to be attending a state university. In this respect our series is a selective one, more nearly comparable to the Howard University series presented by Herskovits than to any of the other groups.

Since only 51 cases were available for the Negro series, it was felt that there would be little gain in accuracy from using the entire white series. Consequently, 51 cases were selected at random from the much larger number of white cases available.

---

* I am indebted to Dr. C. H. McCloy, under whose direction this study was carried on, for his permission to use these data, and to Dr. Wayne W. Massey and Mr. Franklin Burghardt, who took all of the measurements used herein.

The following measurements were taken; for those marked with an asterisk (*) the techniques described by Martin[10] were used. All measurements except weight were taken to the nearest millimeter. All lateral measurements were taken on the left side.

*1. Standing height—using the wall scale.

*2. Weight—using a standard platform scale graduated in pounds.

*3. Sitting height—measured on the wall scale, the subject seated on a 40 cm. stool.

*4. Cervicale height—from cervicale to floor, measured with anthropometer.

*5. Supersternale height—from supersternal notch to floor, measured with anthropometer.

*6. Tragion height—from tragion to floor, measured with anthropometer.

*7. Tibiale height—from tibiale to floor, measured with anthropometer.

*8. Sphyrion height—from sphyrion to floor, measured with anthropometer.

9. Ilium height—with subject seated, from iliac crest to stool, measured with anthropometer.

*10. Hip width—bi-iliac diameter, measured with broad sliding calipers, using maximum pressure.

11. Ilium width—distance from anterior superior spine of ilium to posterior superior spine of ilium, measured anteroposteriorly with anthropometer.

12. Anterior superior spine width—distance between anterior superior spines of ilia, measured with anthropometer.

13. Posterior superior spine width—distance between mid-points of posterior superior spines of ilia, measured with anthropometer.

14. Lumbale above or below posterior superior spine—distance of lumbale above or below a line joining the posterior superior spines of the ilia, measured with anthropometer.

*15. Shoulder width—biacromial diameter, measured with anthropometer.

*16. Upper arm length—acromion to radiale, measured with anthropometer.

*17. Forearm length—radiale to stylion (hand supinated) measured with anthropometer.

*18. Hand length—stylion to dactylion, measured with anthropometer.

19. Elbow width—bicondylar diameter of humerus, measured with broad sliding calipers, using maximum pressure.

20. Knee width—bicondylar diameter of femur, measured with broad sliding calipers, using maximum pressure.

*21. Chest width—at level of xiphoid cartilage, measured with broad sliding calipers, using no pressure.

*22. Chest depth—at level of xiphoid cartilage, measured with broad sliding calipers, using no pressure.

*23. Neck girth—at smallest part of neck, measured with steel tape.

*24. Upper arm girth—over greatest bulge of biceps muscle, arm hanging at side, measured with steel tape.

*25. Forearm girth—over greatest bulge of extensor group, arm hanging at side, measured with steel tape.

*26. Thigh girth—just below gluteal fold, measured with steel tape.

*27. Calf girth—over greatest bulge of calf muscles, measured with steel tape.

28. Foot length—foot prints are taken, toes, sides and heel marked with pencil, and measurement made from print, using millimeter ruler.

29. Foot width—from foot print, with millimeter ruler.

30. Heel to sphyrion—the position of sphyrion was marked on the foot print, and measurement made from print with millimeter ruler.

31. Heel to proximal end of first metatarsal—marked on foot print and measured with millimeter ruler.

32. Chest front fat—at a point half way between the sternum and the sagittal plane through the axillary line, at the level of the xiphoid cartilage, the amount of skin and subcutaneous tissue was measured using the "fat" calipers first designed by the American Child Health Association, with the spring regulated to "standard" tension, the calipers being held vertically.

33. Chest back fat—over the greatest bulge of the erector spinae muscle at the level of the xiphoid cartilage.

34. Abdomen fat—at a point approximately half way between the left nipple and the umbilicus, over the lowest rib.

35. Supra-iliac fat—just above the crest of the ilium.

From these measurements the following additional measures were computed:

36. Upper head height—standing height minus tragion height.

37. Neck length—tragion height minus cervicale height.

38. Torso length—cervicale height minus leg length.

39. "Chest slant"—cervicale height minus supersternale height.

40. Leg length—standing height minus sitting height.

41. Arm length—upper arm length plus forearm length plus hand length.

42. Lower leg length—tibiale height minus sphyrion height.

43. Upper leg length—leg length minus tibiale height.

44. Total fat—sum of four fat measurements.

45. Chest Index—chest width divided by chest depth.

46. Metatarsale to toe—foot length minus heel to metatarsale.

47. Ilium Index—anterior superior spine width divided by posterior superior spine width.

The mean heights of the two groups were computed, that of the Negroes being 174.41 cm. and that of the whites being 176.53. (Both distributions were normal in appearance, the coefficient of variation being 4.6 for the Negroes and 2.9 for the whites.) This difference in mean height was unexpected, and, from a statistical point of view, unfortunate, since it meant that the measurements of the two groups could not be compared directly. To test the representativeness of the white sample, the mean stature of the entire series of 350 cases was computed and found to be 176.75 cms. This would indicate that the mean for the random group of 51 was not spuriously high. It was impossible to test the mean of the Negro group in the same way, since no other cases were available. The critical ratio, 1.58, indicated that the difference was of doubtful statistical significance, but from a prac-

tical point of view the difference seemed great enough to influence comparisons of all other measurements on the two groups. To eliminate the influence of this difference in gross size, each measurement for each individual was divided by his standing height, and expressed as a percentage of standing height. It is from these percentages that our comparisons are drawn.* The means, standard deviations,† critical ratios, and coefficients of variation‡ for these percentages and certain other proportions are shown in Table I.

For the convenience of other investigators who may wish to compare the direct measurements of our Negro group with those taken on other groups, means for the original Negro measurements are given in Table II.

Stature.—As mentioned above, the mean stature of the Negro group is 174.41 cms. and that of the whites 176.53. The Negro mean is most nearly comparable with the Western Reserve series[12] of cadavera for the Negro, 174.4 cms., but exceeds that of the Howard University series, 171.1 cms.[8] The white mean is surprisingly high, exceeding that found by Davenport and Love[4] for their entire series of 96,596 cases, 171.99 cms., as well as that found by them for their Iowans, 172.82 cms. However, the University population is a selected group which might reasonably be expected to exceed a cross section of the total population in such a developmental trait as height.

Weight.—The average weight of the Negro is 5.48 pounds greater than the average weight of the white, despite the fact that the average height of the white man is 2.12 cms. greater. This finding is in accord with Davenport's and Love's reported mean weights of 149.53 for the Negro and 144.67 for the whites. But in contrast to the greater weight of the Negro is the heavier deposit of fat on the white. This would seem to indicate two things: (a) that the white group is somewhat better nourished even though lighter in weight; and (b) that the Negro is somewhat more heavily built. This second indication is borne out in subsequent findings concerning bony measurements.

Arms.—There seems to be complete agreement among the various investigators that the Negro has longer arms than the white.[4,7,9,12,18] This is borne out by our findings. It will be seen that the arm length

* It would have been much simpler to divide the mean for each measurement by the mean height for that group, but such a percentage would be much less exact, since the quotient of the means is very rarely equal to the mean of the quotients, and such a procedure makes it impossible to obtain measures of the variabilities of the groups. In order to have some measure of the statistical reliability of the differences found, the more tedious procedure of dividing each measurement of each individual by the standing height of that individual was adopted.

† *Cf.* W. W. Howells, "Some Uses of the Standard Deviation in Anthropometry," *Human Biology*, 8, 592, 1936, for comments on the use of the standard deviation for anthropometric measurements with 50 or more cases.

‡ The coefficient of variation is not strictly applicable to index numbers or quotients. It is given here as being suggestive in comparing the two groups for any specific quotient, but it should not be interpreted as being comparable between two different measurements.

TABLE I

BODILY PROPORTIONS OF AMERICAN NEGRO AND WHITE MALE COLLEGE STUDENTS

	Means		S.D.		Critical Ratio†	Coefficient of Variation	
	Negro	White	Negro	White		Negro	White
Stature	174.41	176.53	8.06	5.25	—1.58	4.6	2.9
Weight (lbs.)	158.73	153.15	18.82	15.48	1.69	4.6	3.0
Total Fat	68.28	72.12	14.33	10.43	—1.54	21.0	14.5
Arms:							
*Total Arm Length	46.60	45.45	1.11	1.12	5.22	2.4	2.5
*Upper Arm Length	19.43	19.43	.61	.61	.00	3.1	3.1
Upper Arm Length / Arm Length	41.75	42.76	.85	.71	—6.46	2.0	1.7
*Forearm Length	15.31	14.59	.55	.52	6.79	3.6	3.6
Forearm Length / Arm Length	32.84	32.08	.73	.72	5.29	2.2	2.2
*Hand Length	11.92	11.51	.48	.42	4.59	4.0	3.7
Hand Length / Arm Length	25.49	25.32	.78	.72	1.10	3.1	2.8
*Elbow Width	4.11	3.89	.25	.20	4.77	6.1	5.1
*Arm Girth	17.16	16.18	1.52	1.09	3.74	8.9	6.8
*Forearm Girth	15.94	15.04	1.13	.73	4.73	7.1	4.8
Legs and Feet:							
*Total Leg Length	48.58	47.87	1.44	1.23	2.63	3.0	2.6
*Upper Leg Length	21.21	21.72	1.18	1.30	—2.08	5.5	6.0
Upper Leg Length / Leg Length	43.70	45.57	1.40	1.93	—5.61	3.2	4.2
*Lower Leg Length	23.38	22.06	1.09	.90	6.69	4.7	4.1
Lower Leg Length / Leg Length	47.90	46.20	1.62	1.68	5.18	3.4	3.6
*Sphyrion Height	4.20	4.10	.32	.41	1.27	7.6	10.0
Sphyrion Height / Leg Length	8.59	8.64	.76	.83	— .29	8.8	9.6
*Knee Width	5.60	5.46	.24	.25	2.74	4.3	4.6
*Thigh Girth	31.70	30.64	2.60	1.92	2.39	8.2	6.3
*Calf Girth	21.14	20.30	1.38	1.37	3.07	6.5	6.7
*Foot Length	15.67	14.72	.50	.58	2.86	3.2	2.5
Foot Length / Leg Length	32.24	30.74	1.62	1.54	4.78	5.0	5.0
*Foot Width	5.60	5.07	.31	.27	9.11	5.5	5.3
Foot Width / Leg Length	11.58	10.55	.92	.69	6.39	7.9	6.4
Foot Width / Foot Length	35.78	34.28	2.24	1.63	3.87	6.3	4.8
Heel-Sphyrion / Foot Length	24.97	23.45	1.50	2.50	3.72	6.0	10.7
Heel-Metatarsale / Foot Length	51.10	53.14	2.99	1.87	—4.12	5.8	3.5
Metatarsale-Toe / Foot Length	48.99	47.08	2.99	1.90	3.85	6.1	4.0
Trunk, Head and Neck:							
*Sitting Height	51.55	52.24	1.47	1.29	—2.51	2.9	4.9
*Torso Length	36.30	36.84	1.43	1.23	—2.02	3.9	3.3
*Neck Length	7.77	7.59	.89	.81	1.04	11.5	10.7

TABLE I (Continued)

	Means		S.D.		Critical Ratio†	Coefficient of Variation	
	Negro	White	Negro	White		Negro	White
*Upper Head Height	7.57	7.73	.66	.42	—1.42	8.7	5.4
*Neck Girth	21.63	20.48	1.30	1.23	4.62	6.0	6.0
*Shoulder Width	23.17	21.82	1.40	1.19	5.25	6.0	5.5
Shoulder Width / Sitting Height	44.85	41.81	1.91	2.35	7.14	4.3	5.6
Shoulder Width / Arm Length	49.30	48.11	2.85	2.57	2.21	5.9	5.3
*Chest Depth	12.62	12.17	.86	.72	2.87	6.8	5.9
*Chest Width	17.21	16.37	1.10	.92	4.17	6.4	5.6
Chest Index	138.20	135.00	10.20	8.40	2.05	7.4	6.2
*"Chest Slant"	2.85	3.41	.82	.77	—3.54	28.8	23.6
*Hip Width	15.62	15.90	.80	.76	—1.84	5.1	4.8
Hip Width / Sitting Height	30.35	30.75	1.57	1.64	—1.27	5.2	5.3
Hip Width / Leg Length	32.48	33.58	2.17	1.66	—2.90	6.7	4.9
Ilium Index	2.60	2.73	.23	.35	—2.22	8.8	12.8
*Lumbale Distance above or below Posterior Superior Spine	.81	1.33	.89	.94	—2.87		
*Ilium Height	12.57	12.52	.82	.77	.34	6.5	6.1
*Ilium Width	9.39	9.83	.51	.55	—4.22	5.4	5.6

† For those measurements for which the white mean exceeds the Negro mean the critical ratio is marked —.

* All measurements marked with an * have been divided by the stature of the individual before the means were computed, and represent the means of per cents of stature.

TABLE II

MEAN VALUES FOR ANTHROPOMETRIC MEASUREMENTS OF AMERICAN NEGRO MALE COLLEGE STUDENTS (51 cases)

	Mean*		Mean*
Weight (lbs.)	158.73	Total arm length	81.15
Standing height	174.37	Upper arm length	33.84
Sitting height	89.71	Lower arm length	26.60
Tragion height	161.38	Hand length	20.71
Cervicale height	147.83	Shoulder width	40.20
Supersternale height	143.01	Chest width	29.90
Tibiale height	47.74	Chest depth	21.76
Sphyrion height	7.24	Hip width	27.18
Total leg length	84.66	Elbow width	7.07
Upper leg length	36.92	Knee width	9.67
Lower leg length	40.50	Neck girth	37.60
Foot length	27.22	Arm girth	29.75
Foot width	9.72	Forearm girth	27.64
Heel-sphyrion	6.79	Thigh girth	55.14
Sphyrion-metatarsale	7.12	Calf girth	36.69
Metatarsale-toe	13.31		

* All means except that for weight are given in centimeters.

of the Negro is 46.60 per cent of his stature, while that of the white is 45.45 per cent. These figures compare very closely with the indices 46.85 for the Negro and 45.60 for the white reported by Davenport and Love.

Concerning the proportions of the arm, Todd [12, 13] states that the upper arm of the Negro is short in proportion to arm length, while the greater length and width of the hand is proportional to the greater arm length. Hrdlicka[9] reports a greater length of hand for the Negro, both absolute and in proportion to stature. Our data would indicate that the upper arm length relative to stature is the same for both groups, but that the Negro upper arm is shorter in proportion to total arm length. Hand length is greater relative to stature, but is practically the same relative to arm length.

The arm bones of the Negro seem to be somewhat heavier, as indicated by the greater transverse diameter of the epicondyles of the humerus. This greater bone size is doubtless a contributing factor in the greater weight of the Negro.

Arm girth and forearm girth are measurements of rather doubtful value anthropologically, since they are influenced by muscular development, subcutaneous tissue, and bone size, but since they are available they are presented for whatever value they may have. It will be observed that the Negro exceeds the white in both measurements.

Legs and Feet.—It seems to be generally conceded that the Negro has longer legs than the white.[4, 7, 9, 12, 13] Again we find our series to be in agreement in the main with the findings of other investigators. Todd [12] and Todd and Lindala [13] state that the Negro has longer legs, but that there are no differences in the thigh, shin, foot length, and foot width relative to leg length. Hrdlicka reports longer legs, longer feet and wider feet relative to height, and a greater foot index (width/length) for the Negro. Davenport and Love found greater leg length and slightly greater knee height for the Negro. Freiberg and Schroeder[5] in a study of arch height and incidence of hallux valgus concluded that because of differences in foot proportions, the Negro should not wear a shoe designed for the white man's foot.

From our data, the total leg length of the Negro is greater relative to height, the upper leg length is slightly shorter, and, when compared with leg length, significantly shorter. (This disagreement with Todd may be due to differences in technique. On the cadavera it is easier to measure femur length directly. In the present data, leg length was found by subtracting sitting height from standing height, and upper leg length by subtracting tibiale height from leg length.) The lower leg of the Negro is longer relative both to stature and to total leg length. There appears to be little relative difference between the sphyrion heights of the two groups. Todd and Lindala find otherwise, stating that the white has a high heel as compared with the Negro.

In knee width as in elbow width, the Negro appears to exceed the white somewhat.

With reference to the foot, the differences between the two groups are marked. We find the Negro foot longer relative to stature, and also longer relative to leg length; and we find the Negro foot width greater relative to foot length as well as relative to stature and leg length.

Our data include certain measurements of proportions of the foot which we have not found reported elsewhere, but which seem to be of interest. In distance from heel to sphyrion, the Negro exceeds the white (the projection of the heel is commented on by Cobb [2]), but despite this projection of the heel, the distance from the heel to the proximal end of the first metatarsal, relative to foot length, is less in the Negro, and the length of the foot from the proximal end of the metatarsal to the tip of the great toe is correspondingly greater. We would agree with Freiberg and Schroeder that the Negro needs a specially designed shoe.

Trunk Proportions.—The shorter stem length or sitting height of the Negro has been affirmed by every investigator.[1, 4, 7, 9, 10, 12] Bean[1] reports indices (sitting height/stature) of 50.5 and 51.0 for the Negro as contrasted with 52.7, 52.3, and 52.0 for the white. Hrdlicka gives 51.75 for the Negro and 52.94 for the white; Davenport and Love 50.79 and 52.55 respectively; and Herskovits[7] 51.42 for the Negro. Our index for the Negro, 51.55, lies between that of Hrdlicka and that of Herskovits, while our index for the whites, 52.24, is most nearly comparable to Bean's of 52.3.

With reference to the segments which make up sitting height (upper head height, neck length, and torso length) the differences are not significant.

In girth of neck the Negro very definitely exceeds the white. In this finding we are supported by Davenport and Love.

Todd[12] found the bi-acromial breadth of the Negro to be proportional to his greater arm length, and Davenport and Love found the shoulder breadth of the Negro to be greater relative to his stature. Our data show the acromial breadth of the Negro to be markedly greater relative to his stature and relative to his smaller sitting height, but when compared to arm length, the difference between the two groups is much less, though still present.

With regard to the proportions of the chest, Todd and Lindala report that the Negro chest is shallower than the white, giving indices (chest width/chest depth) of 136.1 for the Negro, and 131.2 for the white. Hrdlicka finds the chest of the Negro wider and deeper, both absolutely and relative to height, and gives indices (chest depth/chest width) of 73.6 for the Negro and 72.9 for the white, indicating that the Negro is slightly deeper. He suggests that this difference may be purely occupational. Davenport and Love find no difference in chest

width relative to height, but report that the chest of the Negro is slightly shallower. Our figures tend to be in accord with those of Todd and Lindala and those of Davenport and Love. For our series, the Negro chest is both wider and deeper relative to stature, and the chest index (chest width/chest depth) of 138.2 for the Negro as compared to 135.0 for the white, would indicate that the Negro chest is somewhat shallower. However, the critical ratio for this index is low, and this difference may not be significant.

The measurement called "chest slant," which was purely experimental and introduced only out of curiosity, was an attempt to measure the slope of the upper ribs, the smaller value indicating the relatively higher thoracic cage. We find that the Negro chest is higher than the white.

That the Negro pelvis is smaller than the white appears to be accepted as a fact by all investigators.[4,7,10,12,13] Todd and Lindala state that the narrow pelvis is a distinctly Negro character, and Herskovits reaffirms this belief. Straus,[10] measuring skeletal material, finds the Negro pelvis smaller in all absolute measurements, but finds no difference relative to sitting height. Davenport and Love find 1.01 cms. difference between the transverse diameters of the hips for the two groups, and Todd[12] finds a difference of 1.9 cms. in ilio-spinous breadth. Our data, too, show the Negro smaller in transverse diameter of the hips relative to stature and relative to sitting height, though our difference is not as great as that mentioned above, and its statistical significance is dubious. Relative to leg length, the difference is more marked. Further investigations in pelvic proportions stress the differences between Negro and white. When the distance between the anterior superior spines of the ilia is divided by the distance between the posterior superior spines, which would give a rough index of pelvic flare, we find less flare in the Negro pelvis. We also find that the posterior superior spine of the white ilium is farther above lumbale, indicating that the sacrum is relatively farther down in the pelvis of the Negro than of the white. In ilium height we find no difference. In antero-posterior ilium width the Negro is significantly smaller, which accords with Straus' findings.

SUMMARY

Forty-seven direct and derived anthropometric measurements on 51 American Negro and 51 white male college students at the State University of Iowa were analyzed as to differences between the two groups, and the findings compared with those of other investigators. In general, the findings of this report agree with the consensus of previous workers in the field. The Negro was found to exceed the white in weight, arm length, forearm length, hand length, elbow width, leg length, lower leg length, foot length and width, knee width, shoulder

breadth, chest depth and width, neck girth, and limb girths, all relative to stature; while the white exceeded the Negro in sitting height, total fat, hip width, and ilium width. Certain differences in foot proportions, chest conformation, and pelvic proportions were also noted.

A new series has been added to the rather scant information available on the physical proportions of the American Negro, and certain measurements not previously mentioned in the literature have been studied.

PART II

We have seen in Part I that there are certain differences in bodily proportions between the American Negro and white male college student. Many of these differences have been shown to be statistically significant. We may now examine them to see whether or not they might have any significance for athletic performance.

1. We noted that the Negro is heavier than the white, although he has less fat. This weight is due in part at least to his heavier bones and greater musculature. This would argue a sturdier construction which would be of advantage in such contact sports as football, but which would have the disadvantage of giving the Negro more weight to move in running and jumping. This disadvantage would be overcome if he had greater muscular strength corresponding to his greater weight. In so far as muscle girths are an indication of the strength of the muscle, our data show that he has this greater muscular development.

2. The Negro has a longer forearm and hand than does the white. This would be advantageous in throwing events. Provided he has the muscular strength to move it, this longer lever can develop greater velocity at the end than can a shorter lever. The longer hand, if accompanied by efficient wrist action, would be advantageous in such activities as shot putting, again applying the principle of the longer lever. In jumping, the longer, heavier arm can develop greater momentum, and this momentum, when transmitted to the body as a whole, should increase the height of the jump.

3. The Negro has a longer leg, of which the upper segment is shorter and the lower proportionately longer. The longer total leg obviously permits a longer stride in running, while the shorter upper leg produces less reaction in the hip in the forward stride. This advantage may be offset by the greater weight of the leg and the bigger foot, which require a greater expenditure of energy to move them through space—but again, he has larger muscles to move the greater weight.

In jumping, the longer leg is evidently an advantage, since he is "split higher up," and so could raise his leg higher. Again applying the principle of the lever, the longer lower leg can develop greater velocity at the end, and serves also as a longer lever with which to push off the ground, thus increasing the distance over which the force can be applied.

4. The Negro has narrower hips. This aids him in running by giving less angular reaction to the forward stride.

5. The foot proportions of the Negro, while somewhat different from those of the white, do not seem to us to offer any definite advantage for running or jumping. The projecting heel of the Negro, about which there has been much discussion in athletic circles, seems evident from our data. But Schultz* has pointed out that this projection of the heel is due not to a longer calcaneus but to a heavier pad of fat. If this projection is due only to a fat pad, it would have no mechanical significance: and the presence of such a fat pad would make it inadvisable to attempt to draw any conclusions from measurements of the external dimensions of the heel.

6. In chest construction, the Negro is definitely handicapped. His chest is shallower, and the slant of the ribs is such that he has a smaller excursion of the chest wall in deep breathing. This, coupled with his markedly lower breathing capacity (15 to 20 per cent less than the white has been reported by several investigators), is a handicap in events of long duration, such as distance running. It is probably of minor importance in the shorter runs.

On the whole, it would seem that there are two sides to the story. In some respects we find that the bodily proportions of the American Negro [illegible]a as to give him a slight kinesiological advantage (theoretically, at least) in certain types of athletic performance. In certain other types, such as distance running, he is somewhat handicapped.

In drawing any conclusions from these findings, it must be remembered that they represent only averages for groups and that within those groups there are wide individual variations. Furthermore, bodily proportions are only one aspect of the whole picture. Such physiological factors as reaction time and muscle viscosity, as well as various psychological factors, play a most important role in determining success in athletic activities, and these are not even touched upon in these data. However, we believe that the results of this study will be of interest to those working with college athletes, representing as they do an attempt to answer quantitatively a question concerning which there has been much discussion.

REFERENCES

1. Bean, Robert Bennett, "The Sitting Height," *American Journal of Physical Anthropology*, 7 (1922) 349–90.
2. Cobb, W. Montague, "Physical Constitution of the American Negro," *Journal of Negro Education*, 3 (1934) 340–88.
3. Cobb, W. Montague, "Race and Runners," *Journal of Health and Physical Education*, 7:1 (1936) 3.
4. Davenport, Charles B., and Albert G. Love. *Army Anthropology*. Vol. XV,

* Adolph Schultz, "Fetal Growth of Man and Other Primates," *Quarterly Review of Biology*, I:4 (1926) 465–521.

Part 1, The Medical Department of the United States Army in the World War, 1921.
5. Freiberg, Albert H., and J. Henry Schroeder, "A Note on the Foot of the American Negro," *American Journal of Medical Science,* 126 (1903) 1033–36.
6. Herskovits, Melville, *The American Negro: A Study in Racial Crossing.* (New York: Alfred A. Knopf, 1928).
7. Herskovits, Melville, *The Anthropometry of the American Negro.* Columbia University Contributions to Anthropology, XI. (New York: Columbia University Press, 1930).
8. Herskovits, Melville, V. K. Cameron, and H. Smith. "Physical Form of Mississippi Negroes," *American Journal of Physical Anthropology,* 16 (1931) 193–201.
9. Hrdlicka, Ales, "The Full-Blood American Negro," *American Journal of Physical Anthropology,* 12–13 (1928) 15–33.
10. Martin, Rudolf, *Lehrbuch der Anthropologie, Vol. I.* (Jena: Gustav Fischer, 1928).
11. Straus, William L., Jr., "The Human Ilium: Sex and Stock," *American Journal of Physical Anthropology,* 11 (1927) 1–28.
12. Todd, T. Wingate, "Entrenched Negro Physical Features," *Human Biology,* 1 (1928) 59.
13. Todd, T. Wingate, and Anna Lindala. "Dimensions of the Body: White and American Negroes of Both Sexes," *American Journal of Physical Anthropology,* 12 (1928) 35–119.

Standards for Testing Beginning Swimming

By Thomas Kirk Cureton, Jr., Ph.D.
Springfield College, Springfield, Massachusetts

THE PROBLEM

IN THE teaching of swimming, there has been a marked tendency for teachers to teach the content specified in tests. The setting of single item achievement tests as criteria to measure beginning swimming is undoubtedly an important factor in the narrow, "campaign" types of courses which are predominantly advocated by the social organizations serving youth. With the goal in view of producing a sound educational experience, graduated in nature, and comprehensive enough to insure the development of well rounded aquatic ability, some modification of a fundamental nature is needed in the testing program.

It is the fundamental thesis of this study that a program of "progressive" testing needs developing, and standards for such a program make the objectives for the research. The study aims to review the content of beginning swimming instruction as recommended by various authorities, and to reduce it to some reasonable degree of standardization, including names, descriptions, quantitative requirements, relative difficulty ratings, and validity ratings. This will make possible the selection of items for teaching and testing based upon much more thorough knowledge of their worth than has been true in the past.

The study aims to review the most important literature of beginning swimming and to prepare a check list of the available skills arranged in logical groups of classification according to instructional emphasis. It is also the purpose to develop the logical basis of the groups and the reasons for the types of skills within each group. The hypothesis of a unified test for boys and girls, as well as older and younger pupils, is investigated to throw light on the possible effect of age, height, weight, and sex on beginning swimming performance.

The purpose is also to study the worth of an empirically constructed test battery of twenty-five items, and to make a normative study of the results of administering the test battery to typical groups of pupils in regular classes of instruction. The total scores resulting from this test battery are analyzed logically and statistically to com-

This paper is a digest of a doctoral dissertation in the Division of Educational Research, Advanced School of Education, Teachers College, Columbia University. The complete study has been published by the Association Press, New York City.

pare the worth of the total score criterion with that of the Standard Single Item Achievement Test for beginners.

Finally, the purpose is to apply the results to the formulation of three batteries of progressive testing batteries to be recommended for meeting the needs for short, medium, and full length courses of instruction.

THE METHOD

The study is limited to the beginning level of swimming ability and to data collected in regular classes of instruction on 991 pupils of both sexes, ranging from 6 to 25 years of age. The pupils were selected as non-swimmers on the basis of not being able to swim a length of the pool, hence, the data are not normally distributed. The data include 236 junior high school boys, 636 girls of varying ages, and 119 college women.

The testing was conducted in six indoor pools and in one camp, but eight groups of pupils were studied independently to make possible the comparison of group differences as well as a study of over-all consistency of results between similar groups. The textbook and article tabulations included seven nationally known authorities in one preliminary study, and twenty-one authorities, six national social agencies, and two prominent city systems in a more comprehensive tabulation. The questionnaire canvass of the opinions of experienced teachers included 85 returns which are summarized in this study, but the results of an associated study by Roy H. Begg makes available the opinions of 143 instructors as a basis of comparison.

The research methods are organized into nine phases, as follows:

1. Gross identification of the skill items used in beginning swimming by tabulation from published textbooks and articles.

2. Reduction to a testing battery of administrable size by logical analysis, grouping, and a trial program.

3. Organization of a refined testing battery of 25 items, including standards of performance for the items and suggestions for systematic administration.

4. Application of the refined battery to 991 pupils in regular classes, and the calculation of normative standards based on the total scores made on the 25 items; and, also, an analysis of the errors of measurement and validity involved.

5. Calculation of the obtained validity, or discriminating power, of the items for differentiating between good and poor performance on two established criteria: (1) the Standard Single Item Test (twenty-fifth item of the battery) using tetrachoric correlation procedures based on a four-fold tabulation and the use of Thurstone's computing diagrams. Success or failure on the twenty-fifth item is correlated with success or failure on the item being studied; (2) the total scores obtained by summing the items passed, with each item counting one

point, using the Richardson-Stalnaker form of the bi-serial correlation coefficient which does not assume normality or continuity of the dichotomized variable.

6. Calculation of the net and percentage contribution of each group of items to the criteria, using multiple regression techniques.

7. Standardization of the items for difficulty by calculation of the percentage of failures in each group and in the total sample; and, also, the calculation of the z-score difficulty ratings for each item.

8. The canvass of opinions by questionnaire methods from experienced teachers on the most valuable items, desirable standards, and the preferred patterns for tests adaptable to beginning level instruction.

9. Synthesis of the results into a series of progressive testing batteries (achievement scales) adaptable to the needs of short, medium, and full length courses of instruction.

CONCLUSIONS

1. The gross tabulation of skills shows as many as eighty-six items which may be arbitrarily classified into seven convenient groups according to teaching emphasis. Such grouping facilitates diagnosis, forces a more balanced and comprehensive outline of instruction, and affords a helpful pattern for selecting skills for experimental purposes. The groups are:

I. Introductory confidence and adjustment skills.
II. Breathing and buoyancy skills.
III. Gliding and body control skills.
IV. Initial diving skills.
V. Leg movements.
VI. Arm movements.
VII. Coordination and combination swimming items.

2. The Experimental Battery No. 2 of 25 items is shown to be a useful instrument for measuring swimming ability. The average reliability, or internal consistency, of the battery by the split-halves method and the Spearman-Brown prophecy formula is .95, and the index of reliability .97. The probable error of measurement is ± 1.05 as computed from a heterogeneous sample of 815 pupils. The range of performance is from 0 to 25, the mean for the entire group is 17.57, mode is 25, Q_1 is 15.53, median is 20.95, Q_3 is 24.26, and the standard deviation is 6.98, all on the arbitrary scale with each item counting one point.

3. The total scores of the experimental battery do not seem to be seriously influenced by age, height, or weight on the basis of the evidence available, nor are the differences between groups of different sexes or ages of sufficient magnitude to justify different tests or standards for boys or girls, or for older contrasted with younger pupils. Possible exceptions include a few items in which the older college women score lower than the elementary or junior high school girls

and boys. Application of the bi-serial formula which does not require normality or continuity of the data gives a correlation of .065 between the total scores and sex as the dichotomized variable.

4. A completely satisfactory criterion of beginning swimming ability has not been established, but a "best average estimate" for this problem was secured by using independently the two criteria of amplitude of ability (the twenty-fifth item) and breadth (the total scores), correlating the items with the criteria and averaging the correlation coefficients by Fisher's z method. The average estimate correlates higher with a subjective rating of the skills by experienced teachers than either criterion taken alone. The criteria correlate .64, with a standard error of estimate equal to 4.44 points on the arbitrary 25-point scale.

5. The 175 bi-serial correlation coefficients resulting from correlating each item with the total score criterion range from .18 to .67, with spuriousness due to the item being contained in the criterion amounting to as much as .084.

6. The 168 obtained validity correlations of the tetrachoric form range from .27 to .98, using the twenty-fifth item as the criterion.

7. The two sets of coefficients correlate .87 by the rank order method, correlating the coefficients after conversion to Fisher's z form. The averaged coefficients range from .09 to .95 for the 25 items. The most valid item is No. 25 (Standard Beginner's Test). The five most valid items are Nos. 25, 24, 23, 22, and 20, items involving some form of actual swimming over deep or shallow water. The coefficients range from .95 to .72.

A second group of five items of lower relative validity includes Nos. 17, 19, 14, 18, and 12, the items being representative of elements involving gliding, flutter kicking, short underwater swimming, and initial diving. The coefficients range from .68 to .61.

A third group of five items of still lower relative validity are Nos. 21, 13, 16, 15, and 11, representative of elements involving breathing, shallow water plunging and submerging, floating and bobbing. The coefficients range from .59 to .52.

The least valid items are Nos. 4, 3, 5, 9, 8, 2, 1, 7, 6, and 10 in the order named from least valid to slightly more valid. The coefficients range from .09 to .47 for this group.

For a short classification battery of the "progressive" type, consisting of the most valid item selected from each category of instructional emphasis, items Nos. 17, 12, 16, 20, 19, 21, and 25 would be included.

For a medium length progressive battery, items Nos. 9, 7, 17, 12, 15, 18, 16, 20, 19, 13, 14, 22, 21, and 25. These include the two most valid items from each category.

A full length progressive battery might well include all 25 items, or at least three from each category, retaining the low statistically valid

items on the basis of their motivational value for the very poorest pupils rather than on the basis of their value for discriminating ability. Their low difficulty ratings make them useful for such a purpose.

8. In general, the items are more valid as they increase in logical complexity and difficulty. Group VII (coordination and combination swimming) has the highest validity. Each group has some net contribution to the criterion ability, with the multiple *R* increasing as the groups are progressively combined for prediction, the *R*'s being .521, .592, .602, .604, and .672 for the combinations, corresponding respectively to I plus II; I plus II and III; I plus II, III, and IV; I plus II, III, IV, and V; and I plus II, III, IV, V, and VI. The addition of Group V (leg movements) does not raise the multiple *R* very much. The land drill items have validity coefficients equal to .33 and .30, indicating their doubtful discriminating value. The underwater swimming and submerging activities are considerably more valid, with coefficients ranging from .58 to .62. The gliding items correlate .61 and .68, being more valid than any of the introductory confidence and adjustment items, or any of the breathing or floating items. The very easiest introductory items are the least valid. Swimming ability seems to be associated much more strongly with elements of actual swimming and least with ability to execute certain land drill movements. Elements of breathing and floating, gliding and body control, willingness to take the feet from the bottom and submerge the body are all strongly associated. It is probable that some items of low discriminating value are useful in the instruction for other purposes than discriminating swimming ability, such as postural training, physiological warm-up, motivation, or for aiding mental concepts of relationships.

9. All of the groups are intercorrelated positively with the lowest correlations appearing in the leg movement group. The size of the correlations range from .212 to .750, which suggests at least one common group factor.

10. The relative percentage contribution of each group to the total score criterion is, in order from Group I to VII, 26.79, .98, 20.89, 1.47, 3.93, 26.30, and 19.64. The multiple *R* of prediction is .952 for all these groups, and the standard error of estimate is 1.626 in terms of items passed. When the criterion is corrected for spuriousness due to the total core containing the item, the relative percentage contributions change to 11.02, 0, 3.28, 61.81, 4.22, 14.28, and 5.39. The multiple *R* for predicting the independent portion of the total score is .861 and the standard error of estimate is 1.702. These proportions are obtained from the squared Betas of the standard score regression equation, with the denominator being the sum of the squared Betas. They may be interpreted as indicating the relative net contribution and validity of the groups.

11. The relative difficulty ratings closely parallel the relative valid-

ity ratings in rank order, the less valid items being less difficult and the more valid items being of greater difficulty. The correlation between the two series is .85.

The ratings range from $-2.03\,\sigma$ to $+.07\,\sigma$ in a fairly regular series, but three moderate jumps in difficulty occur: (1) when the pupil is first asked to take his feet from the bottom and glide on the back, (2) when the flutter kicks in the water are first introduced, (3) when deep water swimming is first introduced. A study of teaching method at these three points would probably be profitable.

The item which is closest to the point at which 50 per cent pass is No. 25 (Standard Beginner's Test).

The relative difficulty ratings correlate .87 by rank order with the opinions obtained in Begg's questionnaire study wherein the replies of 143 experienced instructors were summarized.

12. Opinions from the 85 experienced instructors responding to the questionnaire associated with this study show that they favor a more difficult and comprehensive beginner's test of at least seven items representative of the seven categories of teaching emphasis which they recognize. This plan of classifying the skills is preferred by 74.2 per cent, but only 10.6 per cent stated any alternative plan, these favoring a classification which would place the easiest skills in the first group. As many as 74.2 per cent prefer that items should be selected from all groups for teaching and testing. Progressive testing is preferred by 83.6 per cent with 60 per cent recognizing its value for guidance. A majority think that it is not too costly a plan, too time consuming, or mechanical in nature. The procedure of checking off the skills when arranged in a progressive achievement ladder is favored by 96.4 per cent. Thus, the selection of skills on the basis of relative difficulty is the most important principle in the minds of these instructors. A majority think that swimming cannot be adequately measured by any single test item. Some 82.4 per cent believe that similar standards should apply to boys and girls alike. The preferences for the items on the basis of relative importance correlate .53 with the average validity ratings. The agreement is practically perfect on the most valid item in each group. These instructors believe that little was omitted from the experimental battery which should have been included. Skills which require somersaulting, breath holding under the water for time, jumping in feet foremost without holding the nose, underwater swimming, and positions on the back are the most hazardous items to health. Some 76.5 per cent believe that a preliminary orientation and confidence building period should precede any attempt to test the pupil, and that demonstration and practice should precede all testing.

An Experiment in Self-Directed Study for College Freshmen

By Paul D. Guernsey
Health Education Associate
Department of Health, New York City,
Formerly Associate Professor of Hygiene, Antioch College

When colleges organize their teaching efforts to promote self-education, the pattern which will evolve will differ markedly from present educational procedures. Thus may be summarized some of the results presented to the Carnegie Foundation concerning the Pennsylvania College Studies.[1] Many of the implications of such a conclusion have been revealed during the course of experimental studies in health education at Antioch College during the years 1935–1938. Started with the purpose of developing standardized tests in hygiene, these experiments proved to be of most immediate value in uncovering educational problems.

The results of experimentation of the first two years are reported more fully elsewhere, but a summary of the findings will indicate more clearly the basis and nature of the work here described.[2]

1. Comprehensive hygiene tests given to about six hundred students entering Antioch during the last three years indicate a decided prevalence of misconceptions, ignorance, and superstitions regarding physiology and health. These students have come from thirty-nine of the forty-eight states, and may be considered to reflect somewhat the degree and type of health education received in elementary and secondary schools in the country at large. The need for better teaching both on the lower and higher educational levels was clearly indicated.

2. A random selection of upper class students (third, fourth, and fifth years) consistently demonstrated a better average performance on these tests than entering students. These upper class students had no special health training in college; had taken the broad liberal arts course required of all Antioch students. The achievement of these students was not, however, sufficiently superior to represent a reasonable standard for college graduates. The need for including some definite health education in the Antioch curriculum, preferably in the first years, seemed clearly indicated.

3. Antioch freshman students, as a group, have not demonstrated

[1] William S. Learned and Ben D. Wood, *The Student and His Knowledge* (New York: Carnegie Foundation for the Advancement of Teaching, 1938).

[2] Paul D. Guernsey, "Experiments in Health Education at the College Level," Research Quarterly 9:2 (May 1938).

any inclination to improve their knowledge related to personal and community health on their own initiative and time and without credit and grades. This situation obtained even when these areas in which students were deficient were made known to them; when an attempt was made to motivate them by pointing out the special practical values of such knowledge; and in view of the fact that they knew they were to be retested after a time interval.

College hygiene courses suffer a notorious ill repute. These experiments have been conducted as a search for ways and means of making health education a "self-administered process"; of putting the burden of proof more directly on the individual student to see what health information he would find valuable and to encourage him to get it for himself.

In the light of the results summarized in item 3 above, it seemed apparent that the regularly accredited and graded college courses set up artificial stimuli for accomplishment with which self-directed study, even though designed to meet practical life needs, could not well compete on a purely voluntary basis. In order to retain self-education as the important factor, allowance had to be made for this element to operate in conjunction with the collegiate machinery as set up to enable the "average" student to progress through college.

The freshman class at Antioch is divided, one group going to school full time throughout the year, the other group being on the Antioch cooperative plan of work and study. This division is based primarily on the student's financial need for work and the availability of jobs. In the 1937–38 school year, the eighty-nine students in full-time attendance were required to register for a "Health Study" experimental course which would give them one credit hour and would also be graded. Thereby the experimental course was made to conform with the credit-grade system, presumably to make study time available in the student's program, and, as well, to furnish a grade stimulus. The work, however, was to be done autonomously from a study syllabus requiring approximately twenty hours in a ten-week semester of reading in various books. Seven lectures were given. These were not regularly scheduled and attendance was entirely optional. Since a three-hour final examination was included, the course was designed to require about thirty hours of work for one credit hour.

Differences in previous conditioning and training must in some way be determined if the student's individual needs are to be met, and if he is to start advancement from the point of his present knowledge rather than from some hypothetical "average" point arbitrarily set by his professors. Hence, diagnostic health knowledge tests were given all entering freshmen along with other placement tests. When these tests were scored, a profile sheet was made out and given to each student (both "co-op" and registered students) showing his performance in

relation to the class on each section of the test (eleven sections covering physiology, reproduction, nutrition, community health, etc.), as well as his decile placement on the total test. The instructor held individual conferences with all students registered in the course during the semester. In these conferences the diagnostic test results were reviewed to emphasize the points at which the student could well stand further educating. Also discussed was a check sheet included in the test listing seventy-seven various symptomatic conditions or states, as the basis for discussion of the individual's personal health problems and for further reference, if necessary, to the physician or psychiatrist.

These student conferences were revealing. Most of the students frankly admitted they were doing little or no study. Of the reasons given in explanation the most frequent was to the effect that one credit hour did not have sufficient value to make it obligatory to plan time for the work, particularly since there were no set class meetings requiring regular preparation. A great number of students professed, incidentally, difficulty in planning and doing effective work in any of their courses.

An unexpected factor affecting the efforts of the students, and one highly indicative of the "time-serving" attitude which students have, arose in connection with another course. Many freshmen were registered in a one-credit-hour course, "Current Events." Students went to one lecture each week for nine weeks; sat passively, had no examination, and received a credit hour if the attendance record was acceptable. The "Health Study" course called for about twenty hours of intensive preparation in addition to lectures and a three-hour examination—also for one credit. The incongruity of this situation obviously had a marked effect on the results of the experiment—in fact, almost precipitated a strike against the health course as it became generally realized. The antagonism against the course and the instructor thus created, however, clearly reflects the shallow concepts of education which students develop where progress is evaluated in time and grade units rather than intellectual growth. In the student conferences this point of view was stressed to break down the mounting opposition. The students were much too realistic, however. They were shopping for credit hours and grades in the market as operated, and resentment continued to prevail.

As the results of the diagnostic test were discussed in these conferences, it was observable that the ordinary wording used in many test items was not understood. The general vocabulary deficiencies, as distinguished from the special vocabulary pertaining to hygiene, accounted for many incorrect responses or omitted answers. A correlation was computed between the scores on the health knowledge test and an English vocabulary test given in the freshman placement tests. The correlation coefficient of .54 with a probable error of .047 is not too significant, but is interesting in its implications.

The value of small discussion group meetings or "bull-sessions" with members of the faculty or health service was stressed in the syllabus, at the lectures, and in the conferences. Only one such meeting occurred during the semester.

Students were made aware from the beginning that improvement in knowledge would be heavily weighted in grading their work. The achievement test given at the end of the semester contained the identical items for the diagnostic test, thus affording a method of measuring the individual's improvement against previous performance. The largest part of the test, however, sought to evaluate more specifically what had been mastered in the course content. To weight improvement very highly it was decided that out of a weighting of ten, to allow six for the amount which each individual improved his score on the identical part of the test. Improvement of the individual against his standing in the class was weighted two, and was measured by the relative decile position on the pre-test and re-test. Actual performance on the total achievement test was weighted two so as to make the total weight of ten. Improvement, then, was weighted eight, achievement two. With this method the grade given had some definable value, at least; but as a means of stimulating intellectual growth it seemed a poor substitute for that type of motivation springing from the desire of the student to increase his knowledge.

Graded on this basis, with the range of the three types of performances divided into quintiles for weighting purposes, the distribution followed closely the normal curve. (See table I.)

At the end of the semester, forty-five "co-op" students constituting a control group were given the same test as those who were registered in the course. These "co-op" students had been given the diagnostic test and had received a profile sheet indicating their knowledge status.

TABLE I

Grade	Number of Students		Grade	Number of Students	
A	6	6	D+	10	
B+	1		D	6	19
B	2	10	D—	3	
B—	7		F	11	11
C+	8				
C	16	43	Total	89	89
C—	19				

They were under no obligation to do anything about the matter, however, and did not know they would be retested at the end of the semester.

Table II shows the results on the part of the achievement test, consisting of the 115 items that were identical with the diagnostic test. Only one student registered in the course scored below his pre-test score, and that was by one point. One remained stationary. The rest

of the class gained in varying degrees. The results of this performance, graphed according to the magnitude of scores on the first test, show the gains to be well distributed between people who tested low, medium, or high on the first test. This is indicated specifically. Of the six students gaining forty-six or more points in score, two were in the lowest third, two in the middle, and two in the upper third of the distribution of the pre-test scores. In the control group, ten students apparently knew less at the end of the semester than at the beginning, one remained stationary, the gains clustering largely between one to fifteen points.

TABLE II

STUDENTS RAISING OR LOWERING THE NUMBER OF CORRECT RESPONSES ON ACHIEVEMENT TEST AS COMPARED WITH DIAGNOSTIC TEST

	Students Registered in Course		"Co-ops"	
	No. of Students	Per Cent of Group	No. of Students	Per Cent of Group
Increase of 46–above	6	7		
Increase of 41–45	8	9		
Increase of 36–40	9	10		
Increase of 31–35	16	18		
Increase of 26–30	20	23	1	2
Increase of 21–25	9	10	2	5
Increase of 16–20	8	9	4	9
Increase of 11–15	3	3	8	18
Increase of 6–10	6	7	6	13
Increase of 1– 5	2	2	13	29
No gain or loss	1	1	1	2
Loss of 1– 5	1	1	6	13
Loss of 6– 9			3	7
Loss of 10–15				
Loss of 16–20			1	2

The comparative median scores for the two groups on the two tests are shown in Table III.

TABLE III

	Pre-Test Median Score	Re-Test Median Score
Registered Students	32.56	62.84
Control ("Co-op")	25.09	33.94

The median score for the entire achievement test (312 items) was 156.25 for the regular students; 60.00 for the "co-ops."

It requires no further elaboration to demonstrate that the students registered in the course show greater and more consistent gains as individuals and as a group than do those in the "co-op" group. Viewed in terms of possible improvement, however, the gain of the registered students as individuals or as a group is not at all impressive. When the grades had been recorded, a large group of the registered students were polled to find out the actual time spent in study during the ten weeks. The amount of time averaged between four to six hours in addition

to attending most of the lectures given. That this was a fairly true picture of the case is given credence in the tabulations of the test results by various sections of material. All sections of the material covered in the test, except one, were discussed in a very general way in the lectures. The average gain of the class for the five sections covered in the lectures was 5.2 points per section. In the section that received only partial consideration in lecture form, the average gain for the class was the lowest for any part of the test, 2.3 points. The dependence upon the lectures, rather than self-directed study, is indicated. Also, the gains in the other sections show only about what one would have expected from the lecture attendance alone without other preparation.

SUMMARY

1. A hygiene course was set up in which the material to be covered was organized in terms of the practical life needs of college students. The time requirements for obtaining a reasonable knowledge of this material were carefully adapted to the customary credit basis. College freshmen in the course were expected to organize their own approach to the study with the aid of a syllabus after having been made aware of their own particular knowledge deficiencies through the medium of diagnostic testing. The results of this procedure as measured by a re-test indicated that the attainment both as individuals and as a group fell far short of reasonable expectations. This result occurred in spite of putting a premium on improvement.

2. The course credit and grade system seemed to operate in this situation to bring some pressure on students to do a minimum amount of work of their own organization and enabling them to demonstrate a better performance on a health knowledge achievement test than did students in a control group with no pressure of any kind to improve their knowledge status on health, although they were made aware of their deficiencies. Attendance at lectures, however, seemed to be the principal method used by students registered in the course to get information rather than by self-directed individual study.

The following opinion, based on the three years of experimentation, is given for what it is worth. Self-motivated, self-directed study (i.e. real self-education) leading to uniformly higher standards of achievement in the accumulation of measurable health knowledge is, for the vast majority of Antioch College freshmen, under present conditions, not to be readily realized. Students conditioned to accept as valid indices of intellectual attainment such mechanical and arbitrary educational aims as credits and grades are not likely to undertake real self-education, with all that term implies in contrast. In truth, the pattern which must evolve to promote such education will have to differ *greatly* from the present organization and direction of our teaching efforts.

A Survey to Determine the Status of Soccer for Women in Colleges and Universities of the South, Combined with a Survey of Methods of Teaching Soccer

Conducted by a committee of Southern Directors of Physical Education for College Women

ELISEBETH CONN
HELEN PENDERGAST
MARGARET MCCALL, Chairman

INTRODUCTION

A COMMITTEE was appointed by the Southern Directors of Physical Education for College Women in 1937 to undertake a long term study to determine the status of soccer and speedball for women in colleges and universities of the South. It was impossible for the original committee to carry on the study and a new committee was appointed in the spring of 1938.

A brief outline of the proposed study was presented at the 1938 meeting at which time members of the Association were asked to make suggestions to the committee. The following suggestions were made:

1. That an attempt be made to determine trends.
2. That the study include non-major and major groups.
3. That an opportunity be given to determine various teaching devices.

The purpose of the study was three-fold:

1. To determine the status of soccer for women in colleges and universities of the South.
2. To determine present practices in teaching.
3. To determine problems involved in teaching soccer in the South.

a) Per cent of girls enrolled in physical education taking soccer.
b) No. of weeks devoted to soccer per class.
c) No. of class periods per week.
d) No. of minutes per class period.
e) No. of schools including soccer in the intramural program.

Questionnaires were mailed to 203 directors of physical education in 15 southern states. Of these 113 or 55.7 per cent, were returned; 72, or 63.7 per cent with complete data. Incomplete data on 36.2 per

This article is submitted by the Rules and Editorial Committee of the National Section on Women's Athletics, A.A.H.P.E.R.

cent of the questionnaires was due to the fact that soccer is not included in the instructional program; therefore, due to poor response, the study cannot be considered reliable. The mimeographed questionnaire with a mimeographed letter enclosed was sent out in an unsealed envelope for 1½c; 3c for return postage was enclosed, making a total of 4½c postage in each questionnaire. The committee sent 60 postals as a follow-up, and 36 additional letters were written.

Pertinent questions include the following:

What per cent of the colleges and universities in the South include soccer in the activity program? Is soccer required of non-majors? Of majors? What is the average length of the class period for activity classes? Is soccer included in the intramural program? Is there an agreement on teaching devices and techniques? What are the special problems related to soccer? Is soccer popular in the South?

TABLE I
STATUS OF SOCCER

	Yes	No	No. of Replies	Per Cent Including
Do you include soccer in your instructional program?	51	21	72	71.6
Is soccer required of majors?	37	11	49	75
Is soccer required of non-majors?	23	41	64	36
Is soccer included in your intramural program?	36	32	68	53

TABLE II

	No.	Average	Range
Girls enrolled in physical education	28251	455	64–2000

TABLE III
TEACHING DEVICES

Devices Used	No. Schools	Schools	No. of Replies
Analysis of skills	62	93	67
Demonstrations	63	94	67
Drill on skills	65	97	67
Lead-up games	62	93	67
Actual playing	66	99	67
Lecture	55	82	67
Blackboard diagrams	51	76	67
Miniature fields	17	25	67
Relays	51	78	67
Achievement tests	33	59	67
Skill tests	39	58	67
Theory tests	51	76	67

It will be noted that actual playing is the most popular device, being used by 66 or 99 per cent of the schools, and that drill on skills, demonstrations, analysis of skills, and lead-up games are among the most popular devices used. Replies indicated that the use of lecture method depends almost entirely on the weather, some instructors using the lecture method only in cases of inclement weather. The length of the season in most cases determines the use of skill tests. The majority of the schools do not have provision for miniature fields.

TABLE IV

Time Devoted to Soccer

	No.	Per Cent
Schools devoting 2– 4 weeks per class	10	18
Schools devoting 4– 6 weeks per class	23	42
Schools devoting 8–10 weeks per class	14	45
Schools devoting 10–12 weeks per class	5	9
Schools devoting 12–14 weeks per class	2	4
Schools devoting 14–16 weeks per class	0	0
Schools devoting 16–18 weeks per class	1	2
Average	8	14

(Range—2–18 weeks)

Number Minutes Schools Require Per Class

Minutes Per Class	No. Schools	Per Cent
30	17	27
35	14	23
40	22	35
45	7	11
50	1	17
90	1	17

(Range—30–90 minutes; average, 37.66)
(Highest per cent—35.49 to take forty minutes)

Schools Requiring	Class Periods Per Week	Per Cent
1	1	1.7
29	2	47
30	3	48
2	5	32
Average	3 or	32

(Range—1–5 class periods)
(Highest per cent—48.39—three times per week)

Schools Devoting Sections per Year to Soccer

Schools	Sections	Per Cent	Schools	Sections	Per Cent
19	1	33	1	6	1.7
15	2	26	2	7	3.5
6	3	10	3	8	5.2
7	4	12	1	13	1.7
3	5	5.2	1	18	1.7
			Average	6.7 or	10%

(Range—18 sections; largest per cent—32.76—first section)

Schools Devoting Months per Year

Schools	Months	Per Cent	Schools	Months	Per Cent
10	1	20	5	3	10
8	1½	16	3	4	6
14	2	27	4	4½	8
6	2½	12	1	0	2
			Average	2.33	11.25

(Range 1–9—highest per cent—27.45, two months)

TABLE V

Methods of Teaching Rules

Methods Used	No. Schools	Schools	No. of Replies
Technique	44	67	67
Game	65	97	67
Class lecture	49	73	67
Not taught at any special time	6	9	67

COMBINATIONS

Name of the Combination	No. Recommending Combination
Dribble and pass	41
Passing and blocking (all kinds of passing included)	21
Goal shooting, goal keeping, drop kick and punting	19
Trapping and passing	19
Dribbling and shooting	16
Dribbling and evading	10
Dribbling and tackling	9
Dribbling and trapping	7
Tackling and evading	6
Blocking and trapping	3
Place kick and shoot	3
Place kick, combined with other kicks	3
Intercepting and passing	3
Shouldering and heading	3
Marking and skeleton pass	3
(46 combinations were recommended by less than three schools)	

A Brief Survey of the Present Status of the Health and Physical Education Requirement for Men Students in Colleges and Universities

By K. J. McCristal
Associate Professor of Health and Physical Education
and Emil A. Miller
B.S. 1939, Michigan State College

THE PROBLEM

THIS paper has been written for the specific purpose of indicating the present administrative trends in handling the health and physical education requirement for men students in the colleges and universities of the United States having enrollments of over 2500.

Certain contemplated changes in the service requirements at Michigan State College made it necessary to discover contemporary practices among schools at large, and to that end a questionnaire survey was started in January 1939. Previous surveys of a somewhat similar nature were made in 1921, 1927, and 1932 and their results are used in this paper for comparison with the present findings.

Questionnaires were sent to 78 schools with enrollment of 2500 or more students and replies were received from 62 of them. There have been many changes in the status of required physical education in these schools, some of the changes being so slight as to be insignificant, while others have shown a definite change in trend. The three previous studies did not include health education in their problem, therefore it is impossible to make comparisons in this field.

PHYSICAL EDUCATION

Physical Education Requirement.—In a report of the United States Commissioner of Education for 1937, it was found that 90 per cent of the colleges and universities do require physical education for graduation, a finding which checks very closely with the figures we have compiled in this survey, wherein 89 per cent of the 62 schools answering the questionnaire require physical education for graduation. Figure I indicates the number of years of required work in physical education during the past eighteen years. In 1921, when the College Directors of Physical Education made a study of 260 colleges and universities, their results, when printed in their annual *Proceedings*, showed there were 16 per cent of the schools that had no physical education requirement.

By 1927, when the United States Bureau of Education made a study along similar lines of 182 colleges and universities, which was published as a separate pamphlet, Bulletin No. 14, entitled "Physical Education in American Colleges and Universities," the number of schools with no requirement had been cut down to 3 per cent. A Committee on Physical Education at the University of Michigan made a study of 129 of the largest schools in the country in 1932 and found no significant change in the figures of the 1927 survey. In the last seven years, however, there has been an inclination to disregard the requirement and we are now creeping back to the status of 1921. An encouraging note is seen, in that since 1937 there has been little change in the trend and the indications are that the pendulum has completed its swing and will rest as it is for a time.

Number and Years Required.—Referring to Figure I, most schools

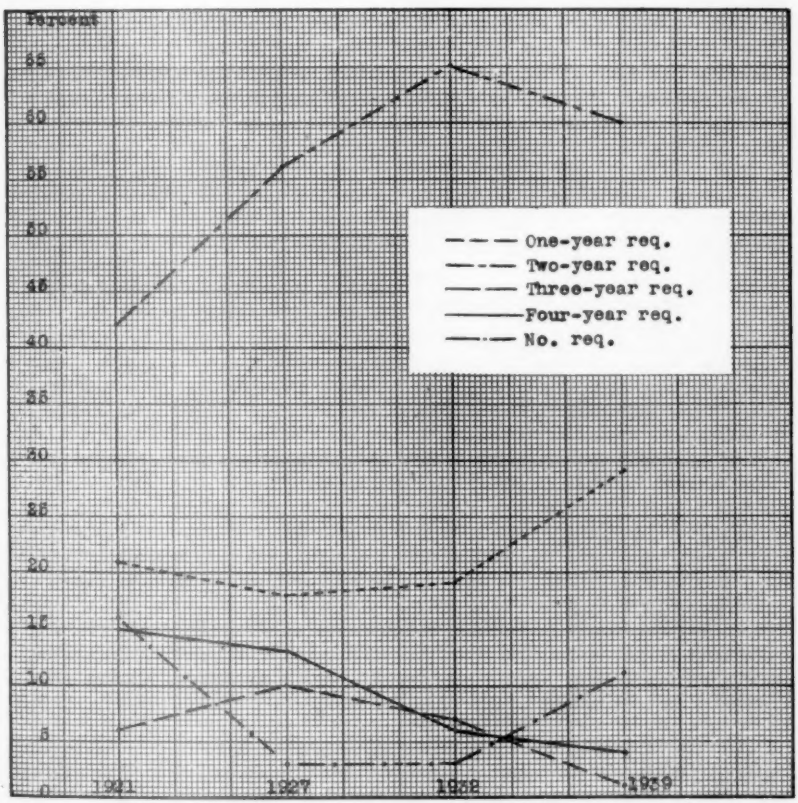


FIG. I. Trend of one-, two-, three-, and four-year required programs of physical education in colleges and universities of the United States during the past eighteen years.

still favor the two-year program, as was so in 1921. The largest number of schools requiring the two-year program reached a height of 65 per cent in 1932 and 60 per cent in this year's survey. The status of the one-year requirement has not changed since 1921 and the three- and four-year requirements have gradually fallen off until they have reached 1 per cent and 4 per cent, respectively.

Credit.—74.5 per cent of the schools give positive credit for physical education courses; the favored trend is to require four hours credit, and this tendency is noticed in the 1932 survey. The range is from one hour to eight hours of credit. The University of Pennsylvania is responsible for the range being as high as it is, being the only school to require eight hours of credit. There are, however, six schools that require six hours credit.

Requirement and Credit for Schools over 5000.—The 1932 survey also analyzed the physical education requirement in institutions of 5000 or more students. It is interesting to add to these findings our own re-

TABLE I

TREND OF THE PHYSICAL EDUCATION REQUIREMENT AND CREDIT GIVEN FOR PHYSICAL EDUCATION COURSES IN COLLEGES AND UNIVERSITIES OF 5,000 OR MORE ENROLLMENT DURING THE PAST EIGHTEEN YEARS.

	No. of Years Requirement				Credit	Credit
	1921	1927	1932	1939	1932	1939
*Boston University	–	2	2	–	—	—
University of California	2	2	2	2	—	Yes
University of Chicago	–	2	2	0	Yes	No
Columbia University	2	2	2	2	Yes	Yes
Cornell University	0	2	2	0	—	Yes
*Fordham University	–	–	2	–	—	—
George Washington University	1	–	2	2	—	Yes
Harvard University	1	1	1	–	No	No
University of Illinois	4	4	2	2	—	Yes
Iowa State University	2	2	2	2	Yes	Yes
University of Iowa	2	2	2	–	Yes	—
University of Kansas	–	2	2	4	Yes	Yes
University of Michigan	1	1	1	1	No	No
University of Minnesota	1	1	1	1	No	Yes
University of Missouri	2	–	2	2	No	Yes
University of Nebraska	–	–	2	4	—	Yes
New York University	2	–	2	1	Yes	No
*College of the City of New York	2	2	3	–	Yes	—
Northwestern University	0	1	1	2	Yes	No
Ohio State University	2	1	1	1	Yes	Yes
University of Oklahoma	2	2	2	2	Yes	Yes
University of Pennsylvania	–	4	4	4	No	Yes
University of Pittsburgh	2	2	1	1	Yes	Yes
*University of Southern California	2	2	2	–	Yes	—
Syracuse University	–	2	2	2	Yes	No
Temple University	–	2	2	2	Yes	Yes
University of Texas	2	2	2	2	Yes	No
University of Washington	2	–	2	2	No	Yes
University of Wisconsin	2	2	1	1	—	No
Yale University	–	1	1	1	No	Yes

* We were unable to secure information from these schools in the 1939 study.

sults and make comparisons, which are shown opposite in Table I.

A number of conclusions can be drawn from Table I. In 1921 it is shown that 19 of the 30 institutions indicated here possessed a physical education requirement; in 1927 this was true of 24 schools out of the 30; and in 1932 this was true of all of the 30 schools represented. This year's study has shown a drop in the number of schools with a requirement, with only 22 out of 29 replies requiring physical education for graduation. In 1932, 16 of the schools (53 per cent) definitely gave credit for physical education, and at the present time 18 of the schools (62 per cent) give credit. Since more schools were studied in the 1932 survey than in our present investigation, probably the results in the former are a little more representative.

Since 1932 the Universities of Nebraska and Kansas have increased the length of their requirement from two to four years, and Northwestern University has raised its requirement from one to two years. This is balanced by a trend in the other direction, wherein Chicago and Cornell have cut theirs down from two years to no requirement, and New York University has dropped from two years to one year. The other schools were evidently pleased with their program and have kept the same requirement as in 1932. Six schools have thought enough of their program to use the same length of requirement since 1921, five of these having the two-year program. Only four schools have remained the same since 1927, namely: University of Pennsylvania with a four-year program; Syracuse and Temple Universities with two-year programs; and Yale University with the one-year requirement.

At the present time, three of these schools of 5000 or more enrollment have four-year requirements; twelve are using the two-year program; and seven have a one-year situation. Strangely enough, none of these schools have a three-year program, and only one, the College of the City of New York, has had it during the past 18 years.

Number of Courses Required for Graduation.—The average number of courses now required for graduation is 3.6, indicating that more schools probably have a four-course requirement rather than a three-course requirement. The range is quite broad, Temple University and the University of Pennsylvania having an eight-course requirement; at the lower level, six schools require only one course for graduation.

Class Meetings per Week.—Our findings indicate that Purdue University is the only school in the country where physical education classes meet five times per week. Chicago has a similar program in regard to the number of times a week the class meets, but they do not have a physical education requirement, all of the work being purely elective and without credit. The average for all the schools fell at 2.4.

Length of Class Period.—In looking over the length of class periods, a very wide range was discovered. Pennsylvania State College led the

group by having a 100-minute class period, this no doubt because of the fact that they have only one meeting per week. Nine schools have decided that 30 minutes is long enough.

TABLE II

A COMPARISON BETWEEN THE 1937 AND 1939 STATUS OF THE PER CENT OF COLLEGES AND UNIVERSITIES USING ONE, TWO, THREE, FOUR, AND FIVE HOURS PER WEEK IN EACH OF THE ONE-, TWO-, THREE-, AND FOUR-YEAR REQUIRED PROGRAMS OF PHYSICAL EDUCATION.

	1 Hour		2 Hours		3 Hours		4 Hours		5 Hours	
	1937	1939	1937	1939	1937	1939	1937	1939	1937	1939
One-year requirement	.8	2	8	25	4	—	—	—	—	—
Two-year requirement	.4	18	50	33	21	13	1.5	—	1	2
Three-year requirement	.4	—	3	2	1.5	—	.4	—	—	—
Four-year requirement	.4	2	5	2	1	2	—	—	—	—

The courses under the two-year program requiring two hours of work per week seem the most favored. The number of schools using this requirement has dropped about 17 per cent during the past two years, but it still remains the favorite. Those using the three-hour plan have dropped, too, while the losses in both these departments have been absorbed by the one-hour program under the same yearly requirement status. The only other change that is significant is that of the two-hour course under the one-year requirement. This arrangement has increased from 8 per cent in 1937 up to 25 per cent in 1939. Four and five hours per week are definitely disregarded at the present time.

Enrollment.—The total enrollment of men students in required physical education courses for all the colleges and universities in the present survey is 64,409 students, presenting an average of 1215 students for each school.

Instructors.—Of the 532 instructors employed by these schools, 51.5 per cent are part-time men and the remaining 48.5 per cent are full-time men.

HEALTH EDUCATION (Hygiene)

Although there is no opportunity for comparison with past studies, the trend of health education in the colleges and universities of the United States at the present time is indicated in the following treatment of data.

Departments Handling Health Education.—That health education is still in its infancy in our colleges and universities can be seen from the results of the question: "Which department teaches the courses in health education?" Some indication of the present trend in departmental distribution is given in Table III.

TABLE III

DEPARTMENTS IN WHICH HEALTH EDUCATION IS TAUGHT AND THE NUMBER OF COLLEGES AND UNIVERSITIES EMPLOYING THE SERVICES OF EACH DEPARTMENT.

Department	Number of Schools
Physical education	24
Hygiene	9
Health service	6
Biology	3
Health education	1
Medical school	2
Physical education—health service	5
Physical education—hygiene	4
Physical education—health education	1
Total	55

Requirement and Credit.—Sixty-one per cent of the 45 schools replying have a health education requirement, and 82 per cent of those requiring health education give positive credit for the work. Figure II shows a comparison by graph of health education and physical education in regard to requirement and credit. Note that of the schools requiring health and physical education, 82 per cent give academic credit for health education and only 74 per cent give credit for physical education.

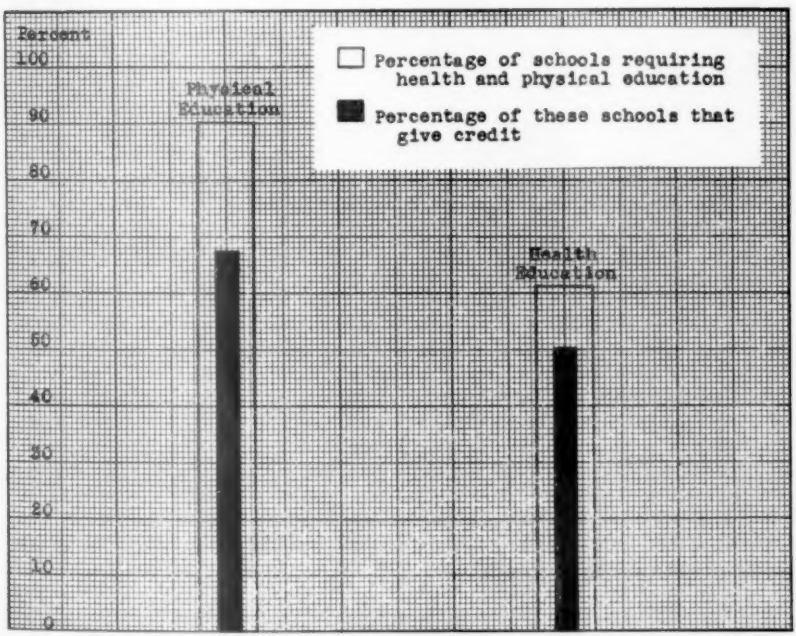


FIG. II. A graph showing the present status of required health and physical education, and the percentage of schools with a requirement that give credit.

Required Number of Courses and Hours of Credit.—The number of courses of health education required by schools averages 1.7, with a range of from one to four courses. There are four schools that require four courses, namely: (1) Brooklyn College, (2) University of Oklahoma, (3) Southern Methodist, and (4) University of Utah. The following schools have a three-course requirement: University of California and University of North Carolina. The number of hours of credit which are given for the courses strikes a mean of 1.8, with a range similar to the number of courses required, from one-half to four.

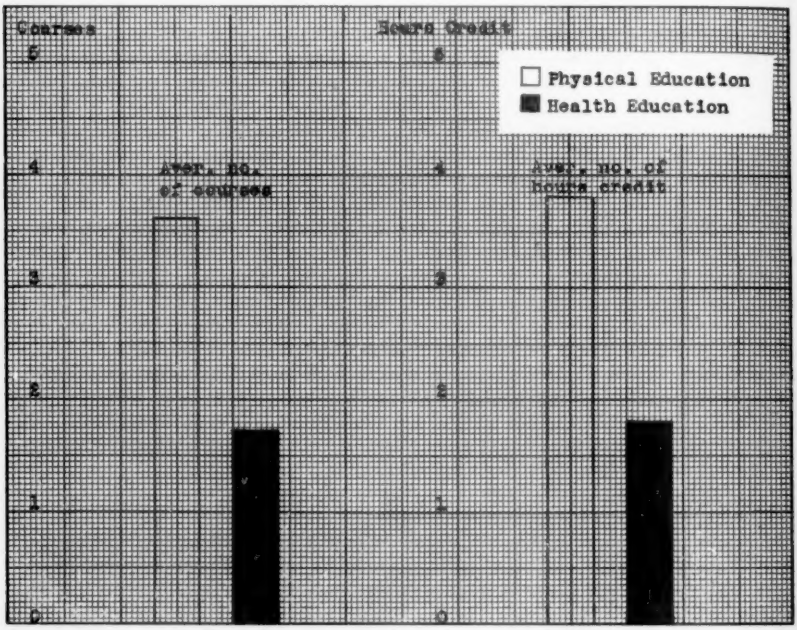


FIG. III. Present trend toward the number of health and physical education courses required and hours credit given in the colleges and universities studied.

Four schools give four hours credit for health education work, two of these being Oklahoma and Southern Methodist as above and the other two the University of West Virginia and the University of Pittsburgh. Five schools offered as low as one-half hour credit, but in all of these the course requirement for graduation was only one. Figure III indicates the contrast between health education and physical education in regard to the number of courses required and the number of hours credit given for these courses.

Health Education Enrollment.—As might be expected because of the recent addition of health education to the university curricula, the total enrollment for the health education classes is smaller on the average

and the range not so wide. Whereas physical education has an average enrollment of 1215 students, the health education programs have an average enrollment of only 770.

Instructors.—There is a sharp trend toward the progressive side of health education as seen by the results wherein 62 per cent of the instructors are full-time men and only 39 per cent are part-time men. The number of part- and full-time men in the physical education division is about even.

SECTIONAL ANALYSIS

An item which was not found in the surveys of 1921, 1927, and 1932 is a sectional analysis of the data from schools reporting. This material is included in the present study and we believe that it will help us in understanding the trend in the various sections. Four arbitrary regions were established, namely: East, South, Midwest, and West.[1]

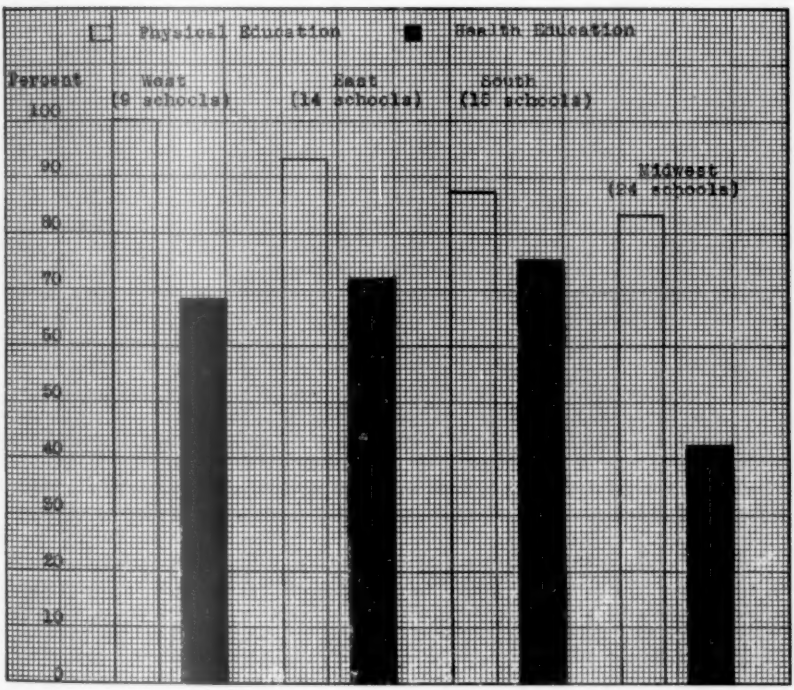


FIG. IV. Present status of the requirement in health and physical education in the colleges and universities studied for each of the four regional divisions of the United States.

[1] Lack of space in this digest prevents the inclusion of a map showing the four arbitrary regions established.

It would be helpful to study Figures IV and V before starting to analyze these data.

Requirement.—The East and West lead in requiring physical education for graduation, with 93 per cent and 100 per cent, respectively. The Midwest has the lowest percentage, 83. In health education requirement, the South has the highest percentages of requirement for health education, 75; the East and West are close behind, and the Midwest is low, with 42 per cent.

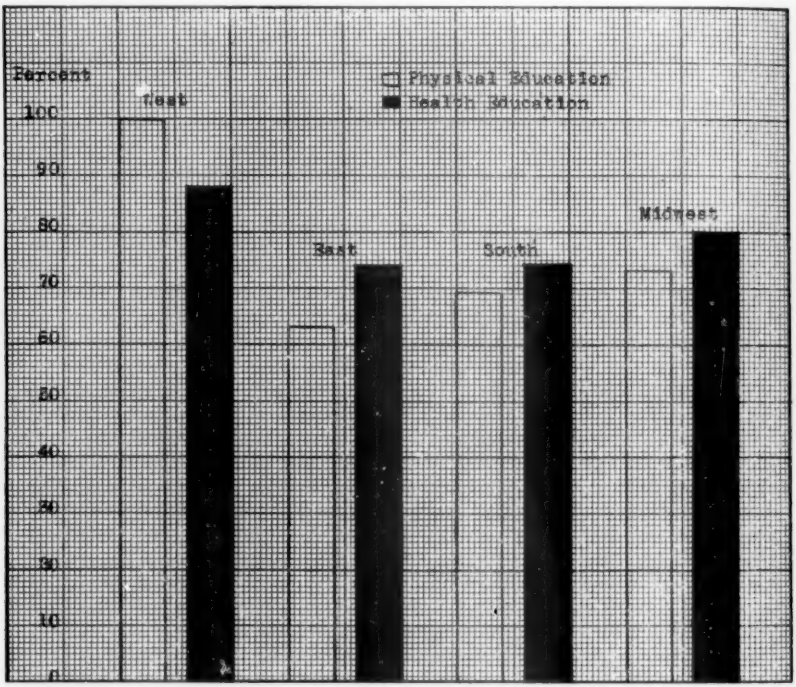


FIG. V. Present status of credit given for health and physical education in colleges and universities for each of the four regional divisions of the United States.

Credit.—It was discovered that although the East ranked second in requiring physical education for graduation, there were fewer schools in the East giving credit for that work than in any of the other three regions. The Midwest and the South also fell off somewhat, but there still is not the difference that is indicated in the East. In the Western division, 100 per cent of the schools give credit for required physical education.

Number of Courses and Hours Credit.—Table IV shows the comparison of the four sections in both health and physical education with

respect to (1) the average number of courses required for graduation, and (2) the average number of hours credit.

TABLE IV

A COMPARISON OF THE AVERAGE NUMBER OF COURSES AND THE AVERAGE NUMBER OF HOURS CREDIT REQUIRED FOR GRADUATION IN HEALTH AND PHYSICAL EDUCATION IN THE COLLEGES AND UNIVERSITIES OF THE FOUR REGIONAL DIVISIONS OF THE UNITED STATES.

	Physical Education		Health Education	
	Av. No. Courses	Av. No. Hours Credit	Av. No. Courses	Av. No. Hours Credit
East	3.7	3.7	1.6	1.7
South	3.6	3.5	2.0	2.3
Midwest	3.0	3.4	1.2	1.5
West	4.4	3.6	1.8	1.7

Considering, first, physical education, we find in regard to the average number of courses required for graduation that the West is the highest with 4.4 courses required. The Midwest is lowest with only an average of 3.0 physical education courses required. This situation also shows up in the average number of hours credit given for physical education work. The Midwest is lowest with an average of 3.4 hours credit and the East and West the highest with averages of 3.7 and 3.6 hours credit, respectively.

A comparison of the results of the two problems above in regard to health education indicates quite a similarity. The Midwest is again the lowest, both in the average number of courses required in health education and the average number of hours credit given for work in health education. The figures for the Midwest are: (1) an average of 1.2 courses in health education required for graduation, and (2) an average of 1.5 hours credit given for work in health education.

Number of Years Required.—The first indications that Midwest schools are doing some progressive thinking along physical education lines are shown in the fact that they have a longer average requirement in years in physical education than any of the other sections. The range is not very broad, however, the Midwest being the highest with an average of 1.9 years of required physical education, and the South being the lowest with an average of 1.7 years of required physical education. The Midwestern schools lose this lead, however, in regard to the number of years of required health education. The Midwest sinks to a low again with only 10 per cent of the schools having a two-year (freshmen *and* sophomores) requirement. The South leads the group with 33 per cent requiring two years, and the East and West are comfortably advanced with 18 per cent and 16 per cent, respectively. The Midwest seems to favor the one-year requirement (freshmen *or* sophomores), but, as mentioned before, schools in the country at large require only freshmen to take health education.

CONCLUSIONS

Physical Education.—Regarding requirement for graduation, we find at the present time that most schools do favor such a requirement, with the trend still in the direction of the two-year program, as it was eighteen years ago. The trend is toward four courses for graduation which will give about the same number of hours credit for the total requirement in physical education. The number of times per week that physical education classes meet tends to three meetings, and all the classes are leaning toward a 50-minute class period. The present trend is toward large classes.

Health Education.—In the health education field, we find, first of all, a tendency to vest the health education program in other departments rather than to put it in the hands of a department of its own. The trend is toward the physical education department rather than any of the others. Sixty-one per cent of the schools studied require health education work for graduation, and 82 per cent of them give definite academic credit for this work. The inclination is to require about two courses for graduation, which is half that of the physical education requirement. Seventy-five per cent of the schools are requiring freshmen, rather than sophomores, to take health education. Classes are meeting twice a week in most schools, with an average of 52 minutes per class period. Although the total enrollment is not as great in health education classes as it is in physical education classes, the number of students per instructor is larger than physical education, being on the average about 168 students per instructor. There are more full-time men than part-time men in the health education work, and this seems to indicate a leaning toward a program wherein specially trained men teach health education.

Motor Ability Tests for High School Girls

By Elizabeth Powell and Eugene C. Howe

Department of Hygiene and Physical Education
Wellesley College

A MOST gratifying series of studies on motor ability tests for high school girls has recently been completed in Newton, Massachusetts, by graduate students in the Department of Hygiene and Physical Education at Wellesley College,[1] and by the members of the Physical Education Department for Girls at the Newton High School under the chairmanship of Mrs. Peter Kuntz. The foundation for this work has been laid over a period of years through a study of the physiometric elements of motor ability, and through the standardization of motor ability tests for college women.[2] In the Newton studies special attention was given to the establishment of adequate motor ability criteria and to the selection of tests which were valid, reliable, suitable, and interesting to high school girls. Consideration was also given to the question of practicability and economy.

Three motor ability criteria were established: the first was a score based upon six sports skill tests; the second was a score based upon a series of tests devised to measure various fundamental skills and various aspects of motor ability; and the third was a subjective rating by a large jury of competent judges who observed the students in action, one at a time, as they ran in an obstacle race.

The six sports skill tests were:

Baseball pitching for accuracy	Soccer dribble
Basketball passing and catching	Tennis backboard rally
Hockey dribble	Volleyball "setup" for partner

The scores on these tests were T-scored, and the average T-score was taken to be the sports criterion.

The objective criterion of general motor ability was obtained from scores on eighteen objective tests, each of which was given twice.

---

[1] K. M. Dunwoody, "An Objective Measure of the Motor Ability of High School Girls with Special Reference to a Subjective Criterion" (Thesis, 1938).

Ya-lan Tsui, "A Motor Ability Test for High School Girls Based Upon an Objective Criterion" (Thesis, 1938).

Theda Hagenah, "The Relative Merits of the Rogers and the Newton Tests as Measures of Motor Ability for High School Girls" (Thesis, 1939).

[2] "Wellesley College Studies in Hygiene and Physical Education," Supplement to the Research Quarterly, March, 1938.

Although most of these involve more than one major element of motor ability, they were classified as follows:

Power and strength
- Broad jump
- Jump and reach
- Medicine ball push
- Medicine ball throw
- Hand grip
- Power wheel

Speed
- Sixty-yard dash
- Baby hurdles
- Obstacle race

Coordination

General:
- Pick and put
- Scramble
- Velocity throw

Hand-eye—object moving:
- Ball catch
- Toss and catch
- Ball wall pass

Hand-eye—object fixed:
- Bowling
- Darts
- Egg race

The T-scores obtained in these tests were averaged for each of the three major motor ability elements—power and strength, speed, and coordination. The average T-score for the three elements was then used as the objective criterion of general motor ability.

The subjective ratings of general motor ability were made by fourteen high school and college teachers of physical education and by seven graduate students in the Department of Hygiene and Physical Education at Wellesley College. This jury of judges observed the students as they ran an obstacle race for time. The four items in the race were:

A 30-inch high jump to be cleared on the run
A basketball toss and catch over a 7-foot net
Rolling the base of a jumping standard around a stool 15 feet away
Climbing a high obstacle constructed of gymnasium apparatus and mats

The judges were instructed to use a ten-point rating scale and to record a score for each of the four parts of the obstacle race. The composite rating by the whole jury was used as the subjective criterion score.

The relative validity of tests considered eligible for practical use in a battery of motor ability tests was determined by correlating test scores with the three criterion scores. It is to be expected that correlations with the objective criterion would be higher than those with either the sports criterion or subjective rating because the tests themselves helped to form this criterion. It might also be stated that the validity of the objective criterion rests, in the last analysis, upon subjective judgment, i.e., upon the decision to include certain tests and exclude others, and also upon the decision to group these tests rather than to average them directly to form the composite score. Negative correlation coefficients are to be expected in the case of all

events measured in time because small scores are better than large ones in these cases. The validity coefficients for the ten most promising tests are given in Table I.

TABLE I

Test Event	Sports Criterion	Criteria of General Motor Ability		Average Coefficient
		Objective	Subjective	
Broad jump	.429	.766	.596	.597
Baby hurdles	—.407	—.765	—.614	—.595
Scramble	—.561	—.645	—.549	—.548
Velocity throw	.428	.731	.444	.534
Sixty-yard dash	—.305	—.703	—.540	—.516
Jump and reach	.294	.634	.555	.494
Medicine ball	.376	.632	.354	.454
Pick and put	—.303	—.493	—.407	—.401
Ball wall pass	.431	.508	.243	.394
Power wheel	—.169	—.716	—.216	—.367

It is interesting to note that the scramble, a test of general agility, correlates more highly with the sports criterion than any other of these ten tests; also that coefficients of about the same order of magnitude are obtained for the ball wall pass, the broad jump, velocity throw, and hurdles. In view of the recent claims that strength and power are such important elements in athletic ability it is surprising to find that the jump and reach and the power wheel tests correlate to such a slight extent with this sports criterion. The broad jump and hurdles correlate most highly with the objective criterion; the velocity throw, power wheel, and sixty-yard dash come next; and the scramble ranks sixth rather than first as it did in the case of the sports criterion. The most important tests with respect to the subjective rating of general motor ability were the hurdles and broad jump; next in importance were the jump and reach, scramble, and sixty-yard dash. Success in the obstacle race apparently depended more upon leg speed and power than upon speed and power in handling balls. In relation to all three criteria, the broad jump and hurdles are clearly superior to the other tests. The scramble and velocity throw do not rank as consistently as the first two, the scramble being more closely related to the sports and subjective criterion and the velocity throw to the objective criterion.

For diagnostic purposes it might be desirable to use a four-part motor ability test battery consisting of the broad jump, hurdles, scramble, and velocity throw. But if the object is to test general motor ability, a three-part battery is just about as effective as a four-part battery, especially if the subjective ratings are to be predicted. The three-part battery consisting of broad jump, hurdles, and scramble has been selected for routine use at the Newton High School. The predictive efficiency of test batteries and individual tests can be compared on the basis of the predictive indices. Correlation coefficients

and predictive indices with respect to the subjective and objective criteria of motor ability are shown for the Newton tests and the Rogers tests in Table II.

TABLE II

Tests and Test Batteries	Subjective Rating r	Subjective Rating P.I.	Objective Criterion r	Objective Criterion P.I.
Newton Tests:				
1. Broad jump	.596	20	.766	36
2. Hurdles	—.614	21	—.765	36
3. Scramble	—.549	16	—.645	24
4. Velocity throw	.444	10	.731	32
Battery 1234	.739	33	.956	71
Battery 123	.734	32	.908	58
Battery 124	.715	30	.947	68
Rogers Tests:				
Strength Index	.402	8	.544	16
Physical Fitness Index	.422	9	.522	15
Right and left grip only			.472	12
Back and leg lifts			.460	11
Push-ups and pull-ups			.445	10
Vital capacity			.355	7

As measures of motor ability for high school girls, the predictive efficiency of the Newton test batteries have been shown to be about three and a half times as good as the Rogers indices. In fact either the broad jump or the hurdles alone is more than twice as effective in predicting motor ability as the entire Rogers test. The predictive efficiency of the grip dynamometer tests was found to be slightly greater than that of the back and leg lifts or the push-ups and pull-ups. Vital capacity scores have less validity than the strength scores as measures of motor ability.

The equipment and the directions for administering the four Newton motor ability tests mentioned above are described here briefly. For further details, reference may be made to the thesis by Tsui.

Broad Jump.—Gymnasium mats and measuring tape. Starting line 2 ft. from edge of mats which are held firmly in place against the wall.

Subject stands toeing the starting line and is told to jump for distance. The best of three trials is recorded to the nearest inch.

Hurdles.—Ten gymnasium benches and 5 split bamboo sticks for setting up the hurdles, Indian club, stop watch. The first hurdle is placed 5 yds. from the starting line, the others at 3-yd. intervals, with the Indian club 3 yds. beyond the last hurdle. The height of the hurdles is 15 inches.

The subject is told to run at top speed over the hurdles, around the Indian club, and back over the hurdles and the starting line. No penalty is made for displacing a hurdle. The score is recorded to the nearest fifth of a second.

Scramble.—Jumping standard with small shelf 4 feet above the floor, tap bell, stop watch. The tap bell is fastened securely to the shelf on the jumping standard and placed 10 feet away from the wall.

The subject starts from a back lying position on the floor with both feet against the wall and the arms stretched sideways at shoulder level, palms down.

He is told to get up and run to tap the bell twice and then return to the starting position, clap the hands on the floor twice, and repeat the whole performance as rapidly as possible until he has made the fourth double tap of the bell. The time is recorded to the nearest fifth of a second.

Velocity Throw.—Fifty-pound dynamometer, strong rope for attachment to the wall or some other fixed support, 210-gram bean bag attached to moving end of dynamometer by a light rope 18 feet long at tension of 20 pounds, target placed about 20 feet from the starting line which is a right angle to the free end of the dynamometer.

The subject is told to throw the captive bean bag as hard as she can toward the target. The rope by which the fixed end of the dynamometer is anchored to the wall is held taut by the operator. Two trials are allowed and the score is recorded to the nearest pound.

It is recommended that these tests be administered twice in order to increase the reliability of the resulting scores. The second series should be given on a subsequent day, thus affording the students some opportunity to improve their initial scores, especially if they were unable to do their best during the first testing period. Such a procedure seems to increase interest in the test and makes it seem more fair to the students.

Achievement scales for the broad jump, hurdles, scramble, and for the battery composed of these three tests have been worked out according to the plan recommended by Cozens. The standard deviation from the mean was determined for a group of 812 Newton High School pupils. Each point on a 100-point scale was then made equal to 6/100 of a standard deviation. Ordinarily the three parts of a test battery would be weighted to give the total score, but in this case the weights were so nearly equal to each other that the unweighted scores correlated .985 with the weighted scores. The achievement scores in the three separate events can therefore be added directly to get the total score. Decile scores as well as standard deviation point scores are indicated in the achievement scales given as Table III.

The use of the achievement scales may be illustrated by the case of a student who made an average record of 10.2 on the hurdles, 62.5 on the broad jump, and 15.7 on the scramble. The point scores for the three events are 59, 53, and 58 respectively. The total 170 has a point score of 58. The scores for the scramble and the test as a whole are in the fourth decile, the hurdles score is in the third decile, and that for the broad jump in the fifth. This information is shown on a sample score card as follows:

NEWTON MOTOR ABILITY TEST

Name .....

Test Event	1st Test	2nd Test	Average	Point Score	Decile Score
Hurdles	10.4	10.0	10.2	59	III
Broad jump	62.0	63.0	62.5	53	V
Scramble	15.4	16.0	15.7	58	IV
Motor ability score: Total			170	58	IV

TABLE III

ACHIEVEMENT SCALES FOR THE NEWTON MOTOR ABILITY TEST

Point Score	Hurdles	Broad Jump	Scramble	Total Points	Point Score	Decile Score
100	7.2	83.0	10.4	275	100	
99	7.3	82.5	10.6	273	99	
98	7.4	82.0	10.7	270	98	
97			10.8	268	97	
96	7.5	81.5	10.9	265	96	
95	7.6	81.0	11 0	263	95	
94	7.7	80.5	11.2	260	94	
93		80.0	11.3	258	93	
92	7.8	79.5	11.4	255	92	
91	7.9	79.0	11.6	253	91	
90		78.5	11.7	250	90	
89	8.0		11.8	248	89	
88	8.1	78.0	11.9	245	88	
87	8.2	77.5	12.0	243	87	
86		77.0	12.2	240	86	
85	8.3	76.5	12.3	238	85	I
84	8.4	76.0	12.4	235	84	
83	8.5	75.5	12.6	233	83	
82		75.0	12.7	230	82	
81	8.6		12.8	228	81	
80	8.7	74.5	12.9	225	80	
79	8.8	74.0	13.0	223	79	
78		73.5	13.2	220	78	
77	8.9	73.0	13.3	218	77	
76	9.0	72.5	13.4	215	76	
75		72.0	13.6	213	75	
74	9.1		13.7	210	74	
73	9.2	71.5	13.8	208	73	
72	9.3	71.0	13.9	205	72	
71		70.5	14.0	203	71	
70	9.4	70.0	14.2	200	70	
69	9.5	69.5	14.3	198	69	
68	9.6	69.0	14.4	195	68	
67			14.6	193	67	II
66	9.7	68.5	14.7	190	66	
65	9.8	68.0	14.8	188	65	
64		67.5	14.9	185	64	
63	9.9	67.0	15.0	183	63	
62	10.0	66.5	15.2	180	62	
61	10.1	66.0	15.3	178	61	III
60			15.4	175	60	
59	10.2	65.5	15.6	173	59	
58	10.3	65.0	15.7	170	58	
57	10.4	64.5	15.8	168	57	
56		64.0	15.9	165	56	IV
55	10.5	63.5	16.0	163	55	
54	10.6	63.0	16.2	160	54	
53		62.5	16.3	158	53	
52	10.7		16.4	155	52	V
51	10.8	62.0	16.6	153	51	
50	10.9	61.5	16.7	150	50	

TABLE III (Continued)

Point Score	Hurdles	Broad Jump	Scramble	Total Points	Point Score	Decile Score
49		61.0	16.8	148	49	
48	11.0	60.5	16.9	145	48	VI
47	11.1	60.0	17.1	143	47	
46	11.2	59.5	17.2	140	46	
45		59.0	17.3	138	45	
44	11.3		17.4	135	44	
43	11.4	58.5	17.6	133	43	VII
42	11.5	58.0	17.7	130	42	
41		57.5	17.8	128	41	
40	11.6	57.0	17.9	125	40	
39	11.7	56.5	18.1	123	39	
38		56.0	18.2	120	38	VIII
37	11.8		18.3	118	37	
36	11.9	55.5	18.4	115	36	
35	12.0	55.0	18.6	113	35	
34		54.5	18.7	110	34	
33	12.1	54.0	18.8	108	33	
32	12.2	53.5	18.9	105	32	IX
31	12.3	53.0	19.1	103	31	
30			19.2	100	30	
29	12.4	52.5	19.3	98	29	
28	12.5	52.0	19.4	95	28	
27		51.5	19.6	93	27	
26	12.6	51.0	19.7	90	26	
25	12.7	50.5	19.8	88	25	
24	12.8	50.0	19.9	85	24	
23			20.1	83	23	
22	12.9	49.5	20.2	80	22	
21	13.0	49.0	20.3	78	21	
20	13.1	48.5	20.4	75	20	
19		48.0	20.6	73	19	
18	13.2	47.5	20.7	70	18	
17	13.3	47.0	20.8	68	17	
16	13.4		20.9	65	16	
15		46.5	21.1	63	15	X
14	13.5	46.0	21.2	60	14	
13	13.6	45.5	21.3	58	13	
12		45.0	21.4	55	12	
11	13.7	44.5	21.6	53	11	
10	13.8	44.0	21.7	50	10	
9	13.9	43.5	21.8	48	9	
8		43.0	21.9	45	8	
7	14.0		22.1	43	7	
6	14.1	42.5	22.2	40	6	
5	14.2	42.0	22.3	38	5	
4		41.5	22.4	35	4	
3	14.3	41.0	22.6	33	3	
2	14.4	40.5	22.7	30	2	
1			22.8	28	1	
0	14.5	40.0	22.9	25	0	

Individuals with scores in the ninth and tenth deciles might well receive special attention and instruction. If one score is markedly different from the others, an error in scoring or in computation might be suspected.

The Newton motor ability tests seem to be of value to the physical education instructor chiefly because they enable her to locate both the markedly superior and markedly inferior pupils early in the season. She can therefore adapt her teaching to their needs as well as to the needs of the majority in the class. Special help can often be given to students of low motor ability without forming an "awkward squad" and thereby reducing the opportunity to learn from more skillful classmates. Psychologically it is an advantage to put at least part of the physical education program on an objective basis, measuring the initial status and progress in terms that are not influenced by personal opinion. Care must be exercised, however, to avoid undue emphasis upon individual deficiencies when the chief task is to offer encouragement and to stimulate more frequent and effective participation in activities.

Chemical Factors of Fatigue

By JOHN T. GOORLEY, Ph.D.
Lex Laboratories, Havana, Cuba

PHYSIOLOGICAL chemists have made remarkable advances in the understanding of the chemical changes in the body during exercise, but this knowledge has not been placed before the average athletic coach. This article is a review of the development of ideas related to the causes of fatigue and the measures available to decrease its severity.

ANCIENT SUPERSTITIONS

A brief review of some of the records of ancient peoples who participated in highly active endeavors discloses that superstition guided them in their selection of food.[1]* The cannabalistic tribes believed that eating the hearts of their strongest foes or wild game imparted strength and fortitude to their warriors. Energetic peoples avoided the flesh of the deer and hare because of the timid nature of these animals. Tiger steaks were at a premium because of the supposed courage and sagacity of this beast. On the other hand, the Roman soldiers were a very hearty lot, although their diet consisted mainly of vegetables. Caesar could be described as conquering the western world on cereals and oils. Pausanias, a Spartan general, declared that the earlier "atheletae" who participated in the public games of Greece ate no animal food. Their bread was made without leaven and kneaded with soft curd cheese to produce a substance called "atheletae" bread. During the later period of Rome the sword fencers were called "hordearii" because their principal food consisted of husked barley. Omar, the chief of the Saracens, a very hardy tribe of nomad Arabs, considered a diet of barley bread, milk, fruits, and water to be the most inducive to good health. Pliny thought that onions were injurious to digestion, but Asclepiades observed that they caused strength. Alexander the Great brought onions to Greece and fed them to his soldiers to increase their zeal; garlic was likewise given to the Greek soldiers and sailors to enhance their courage. The ancient athletes ate large quantities of figs. At Rome the fig was given the place of honor next to the vine in processions in honor of Bacchus, who was reputed to have derived his vigor from it. Cheese was another food held in high repute by the Greek, Hebrew, and Roman soldiers. Thus, it may be observed that the most available food generally governed the choice of diet for the ancient athletes.

---

* Numbers refer to Bibliography at end of article.

MODERN DEVELOPMENTS

During the last century an idea arose that only a meat diet could give the necessary strength and energy to athletes. Instances of tirelessness on the part of meat-fed individuals of the Gauchos and Makololos tribes have been recorded by prominent explorers.[2] Trainers of athletes in the days of John L. Sullivan advised lower quantities of bread and sweet foods, but higher proportions of meat. The origin of this idea is not clear but it may have arisen from the belief that the body tissues resembled the food which was consumed. Thus fat produced fat; lean meat produced muscle. Liquids were not permitted during athletic events even though a considerable amount of fluid was lost in exercise.

It was during the nineteenth century that chemists first attempted to investigate the chemical and physiological value of foods. The science of nutrition was given a start by the work of Liebig, the great German biochemist. He believed that all food substances, particularly proteins, had to be converted into muscle tissue before they could be utilized for energy,[3] and the muscle itself was destroyed when action was evoked. Some time later, in 1865, Fick and Wislicenus subjected themselves to a measured amount of work in climbing Mt. Faulhorn, about 6500 feet high. They proved by their crude methods "that muscular exercise does not necessarily increase the elimination of nitrogen" [4] and energy obtained from protein sources constituted a very low percentage of the total amount expended in ascending the mountain. They concluded that muscular power originated from the oxidation of fat and principally carbohydrates in the muscles. Their work later was confirmed by the better controlled experiments of Voit, Frankland, Playfaire, Bernard, Folin, Pflüger, and other investigators. Chittenden also exploded the idea that a high protein diet was necessary for athletes. He showed that 55 grams of protein having the right biological value were adequate for daily protein requirement of the average adult athlete (provided the bulk of the required calories could be supplied by carbohydrate and fat). The athletes in Chittenden's experiments actually increased in strength and appeared to be in better condition when fed a high carbohydrate diet.[5]

It is now an established fact that there are certain definite relationships in nutritional functions between protein, fat, and carbohydrate. While these classes of foods cannot be categorically assigned certain roles, because their functions overlap, they can be classed according to their most characteristic functions.

During growth periods, the amino acids derived from proteins are needed for structure development and repair. On the completion of growth, the body still needs a certain amount of essential amino acids for repair and catalytic processes. Excess protein is deaminized with the formation of urea and products that may be transformed into carbohydrate and fat. Carbohydrate is used primarily as the source of energy,

but an excess is stored as fat. Fat generally serves as a reserve source of energy to be used after the readily available carbohydrate, glycogen, has been oxidized. The structural protein is utilized for energy only after much of the carbohydrate and fat stores have been depleted. Thus, it may be seen that a plentiful supply of carbohydrate tends to prevent structure breakdown in fatiguing activities, in other words, carbohydrate has a "nitrogen sparing action." [6,7] However, it must not be overlooked that all these interrelated processes are governed by many different enzyme systems which are believed to be formed from vitamins supplied by the diet.

The highly competitive nature of our present-day games has forced the athlete to expend more and more energy in smaller limits of time. The coaching and conditioning of athletes have become specialized scientific professions and have been aided considerably with the knowledge contributed by nutritional and medical experts. Athletes in poor physical or exhausted condition are more subject to injury than well-trained ones. In the fatigued state, the muscle does not respond to nerve impulses but becomes relaxed, loses its tension, and does not protect the bone.[8,9] Fatigue also places an abnormal strain on the functions of the body, therefore, any normal physiological process designed to relieve fatigue is of great interest.

NEWSPAPER REPORTS

During the past several years many newspaper reports have recorded the various steps taken to prevent the onset of fatigue. It should be pointed out here that any drug which produces an artificial stimulation should be avoided (that is, the use of strychnine, adrenaline, or other similar drugs). Japanese swimmers during the 1932 Olympics inhaled quantities of oxygen just before their events. Their exceptional success may or may not have been due to this measure. During the 1936 games the German entrants took sodium bicarbonate to alkalinize their system in order to neutralize the acids of increased metabolism. Honey and candy bars have been given to athletes before and during halves of contests to increase their carbohydrate supply and thus increase their endurance. Salt water has been universally adopted for workers in occupations which produce severe sweating. Athletes have also adopted this measure to prevent salt loss from the body and its accompanying weakness. One trainer has injected dextrose (so-called blood sugar). Another report of interest comes from China where the Japanese soldiers are taking tablets of sugar when unduly weakened by prolonged fighting, lack of sleep, or enervating heat. In her successful comeback in the 1938 Wimbledon championship, Helen Wills Moody, the tennis player, stated that she drank small quantities of a sugar solution each time she passed from one side of the net to the other and that it helped her. Other references could be quoted, but these would seem sufficient to indicate the world-wide interest in this subject.

SCIENTIFIC EVIDENCE

An understanding of the main factors responsible for fatigue and the methods known partially to overcome them can best be gained by a critical examination of the physiological and chemical processes involved in muscular activity. This problem can best be approached by a study of the three main factors involved: (1) nerve control of muscle, (2) chemical mechanism of muscular action, and (3) source of energy for muscular action.

NERVE CONTROL OF MUSCLE

Suppose the safety man on a football team sees (hears) his opponent ball-carrier break loose, and finds himself the only player in a position to prevent a touchdown. A nerve impulse goes from his eye (ear) to the visual (auditory) area of his brain and continues to the region of association. At this point the player reasons and decides to intercept the runner. In order to run, the flexing or bending of a knee

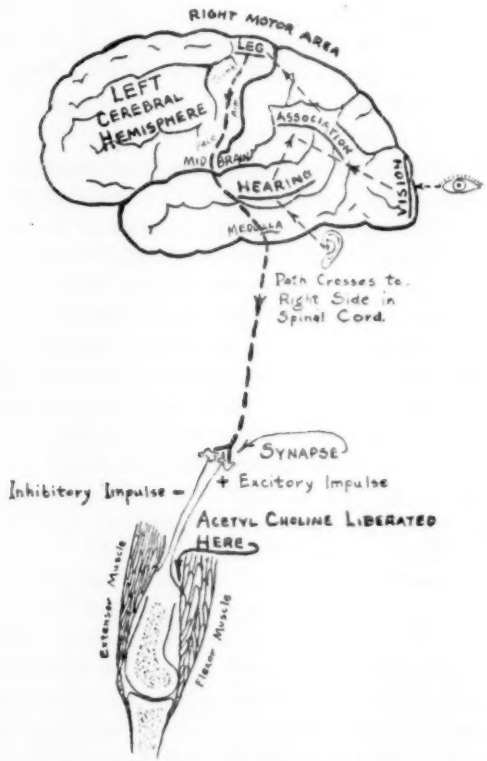


FIG. I. Pathway of single nerve impulse to a right knee flexor muscle fiber.

is one of the first movements; therefore, a nerve impulse goes from the association region to the motor area of the brain, which starts impulses descending to the flexor muscles of the leg. After passing down the spinal column and through several synapses or nerve junctions these impulses arrive in motor nerve fibers which conduct them to the end plates in the muscle fibers. Acetylcholine[10] is liberated and the muscle contracts until the chemical is rendered inactive by its esterase in a fraction of a second. The summation of many of these fiber contractions flexes or raises the leg. In addition there are impulses which arrive to relax the muscles opposing the above movement and to stimulate other muscles performing accessory functions. Thus, before a series of movements have been completed to obtain the desired action of running, many hundreds of individual nerve impulses have led to a like number of individual fiber contractions. Impulses at a too rapid rate set up a nervous fatigue in which the chemical system becomes exhausted. Training and practice undoubtedly help to decrease this type of fatigue by sending impulses to the muscles directly concerned with the least resistance along the shortest route. An awkward action may thus be transformed into one of speed and grace. After a time of continued practice, many voluntary actions become almost reflex responses in nature. It has been shown that exhausted muscle does not have a normal content of acetylcholine and that dextrose and alkali ions speed up its reformation [11]. Thus, an adequate supply of dextrose and sodium ions tend to prevent a reduced efficiency of nerve transmission. Fatigue cannot always be correlated with blood sugar levels and the answer may partially be in the improper resynthesis of acetylcholine.

THE CHEMICAL MECHANISM OF MUSCULAR ACTION

Many theories have been advanced to explain the individual muscle contraction started by the liberation of acetylcholine, but only a few facts are known. The individual muscle fiber shortens and becomes broader, possibly due to changes in osmotic pressure and surface tension brought about by an increased number of chemical molecules liberated inside the fiber. Potassium ions come out and sodium ions replace them with the reverse being true during recovery. A most important point, however, is the source of energy for the contraction. Unlike a steam engine, great changes in temperature are not possible in the muscle, although four-fifths of the energy evolved is liberated as heat and only one-fifth as mechanical work.

From research experiments conducted on isolated muscles, it has been established that the ultimate source of energy for the contractile process is mainly, if not entirely, derived from the oxidation of carbohydrate. It is now believed that the following reactions are the principle ones involved in muscular contraction: [12-17]

The liberation of acetylcholine at the end plate of the nerve trans-

forms the potential energy of the muscle to kinetic energy and action is evoked, probably through the following steps:

Phosphocreatine $\xrightarrow{\text{enzymes}}$ Phosphoric Acid + Creatine + Energy for contractile phase.

Adenosine Triphosphate $\xrightarrow{\text{enzymes}}$ Phosphoric Acid + Adenylic Acid + Energy.

Anaerobic Recovery:

Glycogen $\xrightarrow{\text{enzymes}}$ Glucose Phosphate $\xrightarrow{\text{enzymes}}$ Intermediate Products

Lactic Acid + Energy.

Citric Acid Cycle.

Lactic Acid + Basic (K) Proteinate $\longrightarrow$ Basic (K) Lactate + Acid Proteinate + Energy.

Aerobic Recovery:

Phosphoric Acid + Creatine $\xrightarrow{\text{enzymes}}$ Phosphocreatine.

Lactic Acid + Energy from the oxidation of carbohydrate $\xrightarrow{\text{Liver enzymes}}$ Glycogen.

The resynthesis of phosphocreatine is inhibited by the presence of lactic acid, so it must be removed by the blood or buffered by ammonia or basic proteinates, otherwise the muscle loses its source of kinetic energy. Oxygen is also needed for its resynthesis. One-fifth of the intermediate carbohydrate products are catalytically oxidized, possibly by

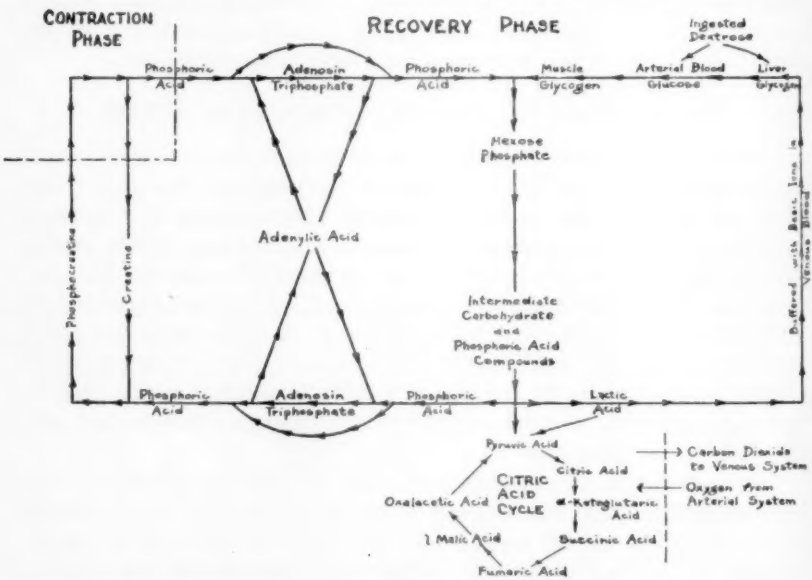


FIG. II. Diagram of present theories representing the chemistry of muscular contraction.

means of the citric acid cycle, to return the potential energy to its normal level. Thus, it may be concluded that the blood stream must continually supply dextrose and oxygen and remove excess carbon dioxide and lactic acid formed during exercise or else a chemical state of fatigue arises.

SOURCE OF ENERGY FOR MUSCULAR ACTION

a) *Metabolism of Dextrose.*—Since the ultimate source of energy in the body is obtained from carbohydrates and since all carbohydrates are changed into dextrose (d-glucose) before conversion into energy, it is convenient to discuss this subject by explaining the metabolism of dextrose.

Under optimal conditions, a solution of dextrose does not remain in the stomach longer than a very few minutes, in fact, a warm 13.5 per cent solution will increase the blood sugar level within three minutes after oral administration.[18-21] The dextrose is selectively absorbed by the capillaries of the portal venous system located in the upper part of the small intestine. It is probably the most rapidly absorbed of all the carbohydrates. The portal system conveys it to the liver where much of it may be converted into glycogen and stored as such. As much as 200 grams may be found in an adult liver. Much of the absorbed sugar continues through the hepatic veins into the heart and then into the arterial blood stream. The entire muscular system is now able to convert this dextrose into muscle glycogen, and 350 grams may be stored there as such. This last quantity remains more or less constant, for during exercise it is replenished as fast as possible by the liver reserve or blood sugar.

Dextrose is probably the only sugar that can be utilized almost directly by the muscle cell. Thiamin, or vitamin B, plays a prominent role in this oxidation of dextrose through its action in the enzyme system. Excess dextrose which cannot be stored or oxidized by the liver and muscles is excreted by the kidneys. An exhausted, isolated heart may be revived by dextrose solution alone, demonstrating its importance to the main muscle of the body.[22] The amount of dextrose required to maintain the energy requirements of the body during exercise depends upon the duration and intensity of the exercise. One gram of dextrose yields approximately four calories when oxidized. It has been estimated that a man sawing wood uses about six calories per minute and that a marathon runner may use up to nine calories per minute; therefore, for one hour of maximum exertion 360 to 540 calories would be expended. This represents over ninety grams (three ounces) of dextrose. As dextrose is furnished to the muscle by way of blood sugar within a few minutes after oral ingestion the administration of dextrose before strenuous activity will furnish the body with additional energy. Even if taken afterward, the exhausted feeling is

lessened.[8, 23, 24] The rate and amount of rise in blood sugar level by the administration of dextrose is well illustrated in Figure III.[25]

During exercise, the adrenalin liberated causes a similar rise in blood sugar level by means of its power to liberate the stored liver carbohydrate.[26-32] After continued violent and heated exercise, severe fatigue

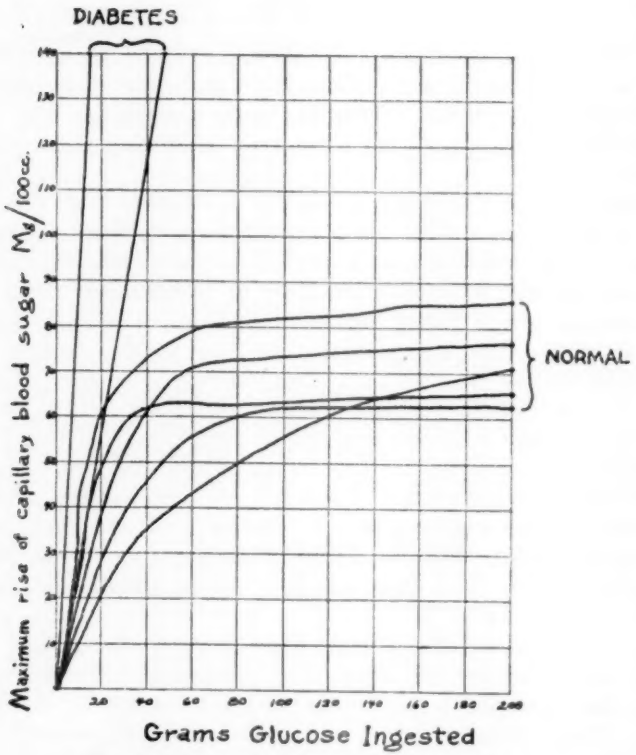


FIG. III. Ingested dextrose and blood sugar rise.

usually appears, with a lowered blood sugar level.[33] It has been reported that the fitness of marathon runners at the end of a race is closely correlated with the blood sugar level. Ingested dextrose deters this action, and it appears that the height of the blood sugar level determines the quantity of the carbohydrate utilized.[34] Up to a certain limit, a higher alkalinity of the system also enhances the utilization.[35]

b) *Oxygen and Carbon Dioxide Exchange.*—Another fundamental component of the source of energy for muscular contraction is oxygen, which is important in the oxidation of dextrose. The methods of introducing oxygen into the tissues are closely associated with the removal of waste products, mainly carbon dioxide. These reactions in general are illustrated by Figure IV.

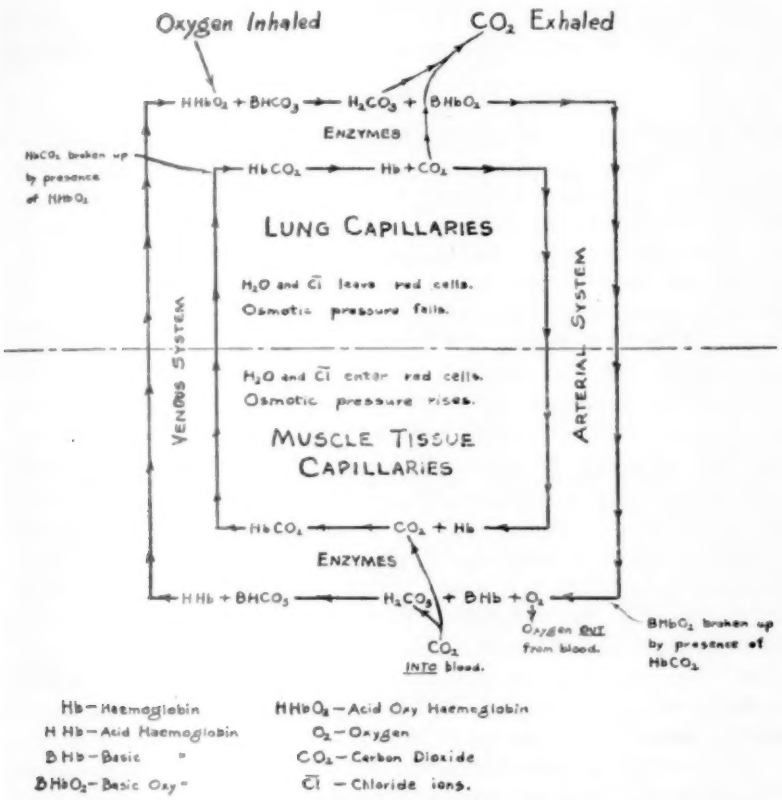

Oxygen Inhaled
CO_2 Exhaled
$HHbO_2 + BHCO_3 \rightarrow H_2CO_3 + BHbO_2$
Enzymes
$HbCO_2$ broken up by presence of $HHbO_2$
$HbCO_2 \rightarrow Hb + CO_2$
Lung Capillaries
H_2O and $\bar{C}l$ leave red cells.
Osmotic pressure falls.
Venous System
Arterial System
H_2O and $\bar{C}l$ enter red cells.
Osmotic pressure rises.
Muscle Tissue Capillaries
$HbCO_2 \rightarrow CO_2 + Hb$
Enzymes
$HHb + BHCO_3 \rightarrow H_2CO_3 + BHb + O_2$
CO_2 into blood.
Oxygen lent from blood.
$BHbO_2$ broken up by presence of $HbCO_2$
Hb — Haemoglobin
$HHbO_2$ — Acid Oxy Haemoglobin
HHb — Acid Haemoglobin
O_2 — Oxygen
BHb — Basic "
CO_2 — Carbon Dioxide
$BHbO_2$ — Basic Oxy "
$\bar{C}l$ — Chloride ions.

FIG. IV. Carbon dioxide-oxygen exchange in lung and muscle tissue.

The red blood cell with its hemoglobin takes oxygen from the lungs and liberates it in the muscle capillaries. Then with the aid of bases it transports the carbon dioxide to the lungs where it is exhaled. It has been demonstrated that after violent exercise the increased oxygen consumption does not cease when the exercise has ended but continues over a length of time proportional to the intensity and duration of the exercise. In the sprints, when very little breathing is possible, the increased production of lactic acid establishes a greater demand for oxygen than the body is able to fulfill. A so-called "oxygen debt" is established. The system needs much more oxygen and therefore the individual continues to breathe more rapidly after exercise has stopped until that need is fulfilled.

During sprints the activity of the muscles may continue for only a very short time because the fibers are not able to contract in a high concentration of lactic acid and in a limited supply of oxygen and dextrose. At this point fatigue sets in rapidly. In less strenuous exer-

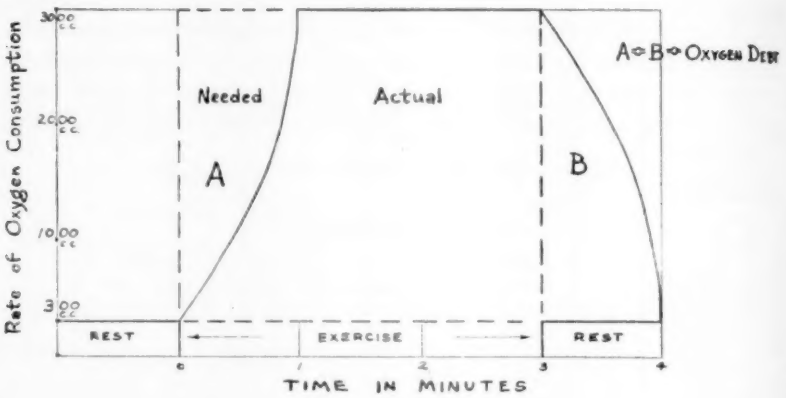


FIG. V. Oxygen debt.

cise, the increased acidity of the blood stimulates brain centers to order faster breathing as in the case of the longer sprints. For a time the R. Q.* becomes greater than 1.0 as the acids drive out more carbon dioxide for the time being, but gradually a more normal value between 0.8 and 0.9 is reached as a greater supply of oxygen removes these acids and the blood acidity is lowered. Soon an equilibrium has been reached with this rapid rate of breathing and the athlete has acquired his second wind.[36] In this state he may continue to function until his readily available energy supplies are depleted. Only a very small oxygen debt will be formed.

In burning carbohydrate, the following reaction takes place: $C_6H_{12}O_6 + 6O_2$ (inhaled) $\rightarrow 6CO_2$ (exhaled) $+ 6H_2O +$ Energy. The R. Q. would be $\frac{6CO_2}{6O_2} = 1$. The value also approaches 1 after a carbohydrate meal or after the ingestion of a dextrose solution which shows the preference for utilizing carbohydrate as the source of energy.[37-41] Carbohydrate requires about 6 per cent less oxygen than does fat to be transformed into the same amount of energy, and the mechanical energy produced is almost 10 per cent more efficient.[17] Thus, if a race requires seven times the amount of oxygen normally used at rest when carbohydrate is the fuel, a fat supply would require eight times the amount of oxygen. Therefore, as the individual approximates his capacity for performance, the more significant does this saving become. Oral administration of dextrose before exercise also inhibits an increase of fixed acid in the blood.[42] It also tends to lower the ketone formation.[43] In continued exercise, the R. Q. gradually falls, showing that fat and protein are used after the carbohydrate stores are depleted. Exhaustion becomes noticeable at this stage. Training strengthens the

* Respiratory Quotient $= \frac{CO_2 \text{ exhaled}}{O_2 \text{ inhaled}}$

heart for faster pumping and develops the lungs for more rapid breathing which enables a more rapid exchange of carbon dioxide for oxygen.[44]

ALKALINE SALTS AND WATER BALANCE

The body has many ways of stabilizing the proper acid-base balance of the blood and other tissues. The blood has a normal *p*H of 7.1 to 7.5 which is slightly basic, but after exercise a more acid condition is produced. The buffers which are most effective and which tend to react with the lactic acid formed during exercise are creatine, ammonia, and the alkaline salts. In order to increase the quantity of basic ions needed to neutralize the lactic acid, sodium ions are sometimes given to insure a sufficient supply. It has been shown that sodium bicarbonate delays fatigue.[14, 45-49] Sodium citrate releases the sodium ion similarly to sodium bicarbonate and in addition furnishes the citrate radicle which catalyzes dextrose oxidation in muscle. During exercise some of the fixed base is excreted in the urine and should be replaced. Excessive sweating dehydrates the blood and other tissues. When this action is combined with the loss and redistribution of sodium chloride, the osmotic equilibrium is changed so much in many cases that muscular cramps result with sudden fatigue.[8, 50] For this reason it is common practice to include a gram or so of sodium chloride dissolved in the 100-200 c.c. of water given to individuals between periods of exercise to prevent osmotic upset.

SUMMARY

The chemical causes of fatigue from exercise are generally considered to be the result of any or all of the following factors:

1. Destruction of acetylcholine caused by too frequent nerve impulses.
2. Insufficient resynthesis of phosphocreatine during the recovery phase to provide potential energy for the muscle.
3. Lack of muscle fuel or blood glucose (dextrose).
4. Lowered carbon dioxide-oxygen exchange which permits the accumulation of acid metabolites.
5. Lack of enzymes due to an insufficient supply of vitamins, principally thiamin (vitamin B_1) which is utilized in the oxidation of carbohydrates.
6. Lowered concentration of basic ions, especially sodium ions, which are necessary to neutralize the acid products of increased metabolism.
7. Loss of water and salt in the sweat and urine resulting in a change in the osmotic equilibrium.

Training partially overcomes some of these causes of fatigue by increasing both the heart and lung capacities, assuring better carbon dioxide-oxygen exchange. Training also increases the alkali reserve of the blood resulting in greater oxygen combining power. Furthermore,

the actions of the athlete become more reflex in nature. It is the duty of the individual to supply carbohydrate, alkaline and neutral salts, and water at appropriate times for better utilization of the system's powers. The general diet must include an adequate supply of vitamins and minerals to form the necessary enzymes and catalysts, as well as enough protein for building and repair, and by all means, enough calories in the form of carbohydrate and fat to insure an adequate source of energy.

BIBLIOGRAPHY

1. Soyer, A., *The Pantropheon or the History of Food and Its Preparation from the Earliest Ages of the World,* (London, 1853).
2. Pavy, F. W., *A Treatise on Food and Dietetics,* (2nd ed.; Baltimore: William Wood & Co., 1881).
3. Chittenden, R. H., *The Nutrition of Man,* (New York: F. A. Stokes Co., 1907).
4. Flint, A., *Muscular Exercise,* (New York: D. Appleton & Co., 1871) p. 9.
5. Chittenden, R. H., *Physiological Economy in Nutrition,* (New York: F. A. Stokes Co., 1913).
6. Mirsky, A., Heiman, J. D., and Swadesh, S., "The Nitrogen-Sparing Action of Glucose in Normal, Phlorhizinized and Depancreatized Dogs," *Am. Jour. Physiol.,* 120 (1937) 681.
7. Cuthbertson, D. P., "The Influence of Carbohydrate on Protein Metabolism," *Jour. Chem. and Ind.,* 57 (1938) 815.
8. Stevens, M. A., and Phelps, W. M., *The Control of Football Injuries,* (New York: A. S. Barnes and Co., 1933).
9. Thorndike, A., *Athletic Injuries: Prevention, Diagnosis, and Treatment,* (Philadelphia: Lea and Febiger, 1938).
10. Fraser, F. C., "Clinical Aspects of the Transmission of the Effects of Nervous Impulses by Acetylcholine," *Brit. Med. Jour.,* I (1938) 1349.
11. MacIntosh, F. C., "Glucose and Acetylcholine Synthesis in a Ganglion," *Jour. Physiol.,* 93 (1938) 46*P*.
12. Potter, V. R., and Elvehjem, C. A., "A Cyclic Reaction Scheme Illustrating Carbohydrate Metabolism," *Jour. Chem. Ed.,* 15 (1938) 89.
13. Lundsgaard, E., "The Chemistry of Anaerobic Muscular Contraction," *Bull. Johns Hopkins Hospital,* 63 (1938) 1.
14. Krebs, H. A., and Johnson, W. A., "Role of Citric Acid in Intermediate Metabolism in Animal Tissues," *Enzymologia,* 4 (1937) 148.
15. Krebs, H. A., Salvin, E., and Johnson, W. A., "Formation of Citric and a-ketoglutaric Acids in the Mammalian Body," *Biochem. Jour.,* 32 (1938) 113.
16. Burk, D., "On the Biochemical Significance of the Pasteur Reaction and Myerhof Cycle in Intermediate Carbohydrate Metabolism," Ward, H. B., in *Some Fundamental Aspects of the Cancer Problem.* (New York: The Science Press, 1937) 141.
17. Dill, D. B., "The Economy of Muscular Exercise," *Physiol. Rev.,* 16 (1936) 263.
18. Cori, C. F., "Absorption of Hexoses and Pentoses," *Jour. Biol. Chem.,* 66 (1925) 714.
19. Groen, J., "Absorption of Glucose from Small Intestine in Deficiency Disease," *New Eng. Jour. Med.,* 218 (1938) 247.
20. Bock, J. C., Schneider, H., and Gilbert, M., "Blood Sugar Studies. II. The Initial Rise," *Jour. Biol. Chem.,* 69 (1926) 9.
21. Cori, C. F., and Cori, G. T., "The Mechanism of Epinephrine Action. 1. The Influence of Epinephrine on the Carbohydrate Metabolism of Fasting Rats,

with a Note on the New Formation of Carbohydrates," *Jour. Biol. Chem.*, 79 (1928) 309.

22. Bogue, J. Y., Chang, I., and Gregory, R. A., "The Metabolism of the Isolated Mammalian Heart Under Partial Anoxia," *Quart. Jour. Exp. Physiol.*, 27 (1938) 319.
23. "Review," *Brit. Med. Jour.*, 2 (1936) 973.
24. Abrahams, H. M., and Abrahams, A., *Training For Health And Athletics*, (London: Hutchinson & Co., Ltd., 1936).
25. Peters, J. P., and Van Slyke, D.D., *Quantitative Clinical Chemistry. I. Interpretations*, (Baltimore: Williams & Wilkins Co., 1931) 119.
26. Meythaler, F., "Die Regulation des Kohlehydratstoffwechsels bei Sport," *Klin. Wchnschr.*, 16 (1937) 951.
27. Levine, S. A., Gordon, B., and Derick, C. L., "Some Changes in the Chemical Constituents of the Blood Following a Marathon Race," *Jour. Am. Med. Assn.*, 82 (1924) 1778.
28. "The Chemistry of Athletic Records," *Brit. Med. Jour.*, 1 (1937) 1213.
29. Dill, D. B., Edwards, H. T., and Mead, S., "Blood Sugar Regulation in Exercise," *Am. Jour. Physiol.*, 111 (1935) 21.
30. Edwards, H. T., Richards, T. K., and Dill, D. B., "Blood Sugar, Urine Sugar and Urine Protein in Exercise," *Am. Jour. Physiol.*, 98 (1931) 352.
31. Edwards, H. T., Margaria, R., and Dill, D. B., "Blood Sugar Concentration in Exercise," *Am. Jour. Physiol.*, 108 (1934) 55.
32. Margaria, R., and Edwards, H. T., "Sources of Energy in Muscular Work Performed in Anerobic Conditions," *Am. Jour. Physiol.*, 108 (1934) 341.
33. McLain, P. S., and Montgomery, E. S., "Observations on the Blood of Workmen Exposed to High Temperatures," *Jour. Clin. Invest.*, 17 (1938) 417.
34. Soskin, S., and Levine, R., "Relationship Between the Blood Sugar Level and the Rate of Sugar Utilization, Affecting the Theories of Diabetes," *Am. Jour. Physiol.*, 120 (1937) 761.
35. Donnelly, J. L., "On the Metabolism of Glucose," *Am. Jour. Physiol.*, 123 (1938) 448.
36. Evans, C. L., *Starling's Principles of Human Physiology*, (6th ed.; Philadelphia: Lea & Febiger, 1933) 180.
37. Bachmann, G., Haldi, J., Wynn, W., and Ensor, C., "The Respiratory Quotient and Carbohydrate Utilization as Affected by Exercise Taken Immediately and Thirty Minutes After the Ingestion of Glucose and of Fructose," *Am. Jour. Physiol.*, 119 (1937) 262*P*.
38. Haggard, H. W., and Greenberg, L. A., *Diet and Physical Efficiency*, (New Haven: Yale Univ. Press, 1935).
39. Haldi, J., and Bachmann, G., "A Comparative Study of the Respiratory Quotients Following the Ingestion of Glucose and of Fructose as Affected by the Lactic Acid and Carbon Dioxide Changes in the Blood," *Jour. Nut.*, 13 (1937) 156.
40. Larson, P. S., and Chaikoff, I. L., "The Influence of Carbohydrates on Nitrogen Metabolism in the Normal Nutritional State," *Jour. Nut.*, 13 (1937) 287.
41. Bachmann, G., Haldi, J., Wynn, W., and Ensor, C., "The Respiratory Quotient and Carbohydrate Metabolism Following the Ingestion of Glucose and of Fructose as Affected by Exercise Taken Immediately and Thirty Minutes after Ingestion," *Am. Jour. Physiol.*, 120 (1937) 579.
42. Schlutz, F. W., and Blish, E., "Effect of Carbohydrate on Certain Factors in Fatigue," *Am. Jour. Dis. of Child.*, 53 (1937) 960.
43. Mirsky, I. A., and Senior, F. A., "'Fat Sparing' Action of Glucose in the Absence of Insulin," *Proc. Soc. Exper. Biol. and Med.*, 37 (1937) 505.
44. Robinson, S., Edwards, H. T., and Dill, D. B., "New Records in Human Power," *Science*, 85 (1938) 409.

45. Himwich, H. E., "Carbohydrate Metabolism," *Ann. Rev. Biochem.*, 7 (1938) 157.
46. Dennig, H., "Über Steigerung der körperlichen Leistungsfähigkeit durch Eingriffe in den Säurebasenhaushalt," *Deutsche med. Wchnschr.*, 63 (1937) 733.
47. Clark, B. B., and Morrissey, R. W., "Effect of Sodium Citrate and Sodium Bicarbonate on Ethyl Alcohol Acidosis," *Proc. Soc. Exper. Biol. and Med.*, 38 (1938) 734.
48. Krebs, H. A., Camb, M. A., and Hamburg, M. D., "The Intermediate Metabolism of Carbohydrates," *Lancet*, 233 (1937) 736.
49. Cape, J., and Severinghaus, E. L., "Rate of Change of Alkali Reserve After Ingestion of Salts of Organic Compounds. II. Rate of Change of Alkali Reserve After Ingestion of Sodium Citrate and Sodium Bicarbonate," *Jour. Biol. Chem.*, 121 (1937) 549.
50. Schlutz, F. W., and Morse, M., "Factors Influencing the Concentration of the Serum Protein, Chloride, and Total Fixed Base of the Dog During Exercise," *Am. Jour. Physiol.*, 121 (1938) 293.

Selected Bibliography for 1938

Compiled by G. B. AFFLECK
Springfield College, Springfield, Massachusetts

AQUATICS

Berry, C. F. "Aquatic Features Part of Golden Gate Exposition." *Beach & Pool.* XII: (Feb. 1938), 6.

Brown, J., Fuhrer, J. W., and Cureton, T. K. "Results of the 1937 National Survey of Y.M.C.A. Aquatics." *Beach & Pool.* XII: (Dec. 1938), 10.

Cureton, T. K., Jr. *National Y.M.C.A. Progressive Aquatic Tests.* (New York: Association Press, 1938), 59 pp. $0.50.

Curtis, K. W. *A Source Book of Water Pageantry.* (Chicago: The College Press, 1936), 129 pp. $1.75. (Mimeographed)

Davenport, F. M. "Aquatic Playgrounds in Long Beach." *Recreation.* XXXII: (Aug. 1938), 297.

Greenwood, F. A. *Aquatics.* (New York: Barnes, 1938), 71 pp. $0.25.

Kaufman, N. H. "Bacteriology, Instruction and General Aquatics." *Beach & Pool.* XII: (Feb. 1938), 28.

Mann, M. "The Coach's Relationship to His Swimmers." *Beach & Pool.* XII: (Feb. 1938), 12.

National Collegiate Official Rules for Swimming, Fancy Diving, Water Polo, 1939. (New York: Am. Sports, 1938), $0.25 (pa.).

Swimming, Water Sports and Safety; A Book of Aquatic Fun. (New York: Boy Scouts of America, 1938), 409 pp. $1.00.

Water Polo. (Anaheim, Cal.: The Interscholastic Sports Publishing Co., 1938), $2.50.

Canoes, Boats, Yachts

Beken, F. W., and Fox, U. *The Beauty of Sail.* (New York: Scribner's, 1938), 279 pp. $10.00. (Quarto. Photos and Comments—Yachts under sail.)

Bruns, H., and Hayes, R. F. "Canoe Racing for High School Boys." *Jr. Health & Phys. Ed.* IX: (June 1938), 370.

Fox, U. *Thoughts on Yachts and Yachting.* (London: Davies, 1938), 356 pp. 35s.

Hinton, T. N. *Dinghy and Small Class Racing.* (London: Witherby, 1938), 212 pp. 10s 6d.

Keith, T. "Cruise Craft 'round the World." *Country Life & Sportsman.* LXXIII: (Jan. 1938), 42.

Martin, H. "The Rowboat Sails." *Leisure.* V: (Aug. 1938), 17.

Notes on Coxing. (New York: Macmillan, 1938) $0.50. (pa.).

Perry, H. W. "Foldboating." *Leisure.* V: (Aug. 1938), 7.

Schoettle, E. J. *Sailing Craft.* (New York: Macmillan, 1938), 786 pp. $2.75.

Smith, R. G. *Sailing Made Easy—Told in Pictures.* (New York: Kennedy Bros., 1938), 124 pp. $3.50.

Talbot-Booth, E. C. *Yachts, Yachting and Sailing.* (New York: Appleton-Century, 1938). 587 pp. $3.00.

Taylor, W. H. "Period Yachts." *Country Life & Sportsman.* LXXIII: (Mar. 1938), 74.

——— "Yachting." *Country Life & Sportsman.* LXXIII: (Jan. 1938), 30; (Feb. 1938), 28; (Mar. 1938), 26; (Apr. 1938), 31; (May 1938), 36.

Van Demark, H. "Shooting Rapids in a Canoe." *Field & Stream.* XLIII: (July 1938), 65.

Woodcock, P. *Cruising for the Novice.* (London: Miles, 1938), 106 pp. 3s 6d.

Diving, Swimming, Lifesaving

Bryant, C. L. "Get the Most out of Aquatics." *Beach & Pool.* XII: (May 1938), 10.

Begg, R. H. "Methods of Teaching Beginners to Swim." (Graduate Thesis, Springfield College, 1938). 101 pp.

Cureton, T. K., Jr. "New England Aquatic Leadership Course." *Beach & Pool.* XII: (June 1938), 30.

Curtis, K. W. "Swimming Stunts." *Recreation*. XXXII: (Aug. 1938), 275.

Draper, G. R. "A Ten-Lesson Plan for Teaching Beginners to Swim." *Beach & Pool*. XII: (Mar. 1938), 7.

Gordon, A. "The Importance of Starts and Turns." *Beach & Pool*. XII: (Mar. 1938), 26.

Hobden, F. W. *Art of Spring-Board Diving*. (New York: Putnam, 1938), 247 pp. $1.50.

Lipovetz, F. J. *Teaching of Swimming, Diving, and Water Sports*. (Minneapolis: Burgess, 1937), 147 pp. $2.75.

Miller, C. "Experience in Life Saving." *Beach & Pool*. XII: (June 1938), 8.

New Y.M.C.A. Aquatic Program. (New York: Association Press, 1938), 104 pp. $1.00.

Parker, J. "School Swimming." *Jr. Phys. Ed. & Sch. Hyg*. XXX: Mar. 1938), 63.

Rennert, M. "Planning a Successful Swimming Campaign." *Beach & Pool*. XII: (Aug. 1938), 5.

Robinson, T. "New Styles—Today's Swimming." *Athletic Jr*. XVIII: (Jan. 1938), 5.

Rodgers, W. W. *Swimming and Diving*. (Washington, D. C.: The Washington Information Bureau, 1013 Thirteenth St., N. W. Service Booklet No. 163), $0.10.

Swimming and Diving. (Philadelphia: American Red Cross, Blakiston, 1938), $0.60.

Tsuruta, Y. "How to Swim the Breast Stroke." *Beach & Pool*. XII: (May 1938), 7.

Natatoria; Construction, Operation, etc.

Ackley, H. "Modern Trend in Design and Construction of Pools." *Beach & Pool*. XII: (Jan. 1938), 10.

Bamberger, J. M. "Latest Development in the Control of Algae and Their Tastes and Odors." *Beach & Pool*. XII: (Jan. 1938), 5.

Blake, T. "Safety and Service for 6,000,000 Bathers." *Beach & Pool*. XII: (Sept. 1938), 12.

Collins, E. K. "Construction and Repair of Swimming Pools by the Pneumatic Pressure Method." *Beach & Pool*. XII: (Apr. 1938), 7.

——— "Pollution Tests." *Beach & Pool*. XII: (Aug. 1938), 7.

——— "Safe Operating Policies Will Protect Your Patrons." *Beach & Pool*. XII: (June 1938), 7.

——— *1938 Swimming Pool Data and Reference Annual*. (New York: Hoffman-Harris, Inc., 1938), 220 pp. $3.00.

Cook, S. A. "School Swimming-Pool Operation and Maintenance." *Am. School Board Jr*. XCVII: (Aug. 1938), 22; (Sept. 1938), 44.

Day, L. J., and Stedman, C. W. "An Elementary Treatise on the Construction, Sanitation, and Operation of Swimming Pools." *Beach & Pool*. XII: (Feb. 1938), 8; (Mar. 1938), 8; (Apr. 1938), 12; (May 1938), 8; (June 1938), 14; (July 1938), 8; (Aug. 1938), 8; (Sept. 1938), 8; (Oct. 1938), 10; (Nov. 1938), 9; (Dec. 1938), 14.

Fern, H. E., Friend, G. E., and Davenport, J. A. "The Hygiene of the Public Swimming Bath." *Jr. Phys. Ed. & School Hygiene*. XXX: (Nov. 1938), 157.

"How Many Bathers in a Pool?" *Am. City*. LIII: (Nov. 1938), 13.

"How to Rebuild Beaches." *Beach & Pool*. XII: (May 1938), 16.

Johnson, A. S. "A Backyard Swimming Pool." *Hygeia*. XVI: (Aug. 1938), 720.

Karns, E. B. "Lighted Water for More and Safer Swimming." *Amer. City*. LIII: (May 1938), 127.

Kipp, H. "Localizing Filter Control." *Beach & Pool*. XII: (June 1938), 9.

Klasson, C. W. "Swimming Pool Legislation." *Beach & Pool*. XII: (Feb. 1938), 5.

Matte, O. H. "Indoor Swimming Pool Design." *Athletic Jr*. XVIII: (Apr. 1938), 29.

Minimum Sanitary Requirements for Swimming Pools and Bathing Places. Dept. Public Health, State of Illinois, May, 1938. 59 pp.

Monteith, J. K. "How to Buy Bathing

Suits." *Beach & Pool.* XII: (July 1938), 6.

Perkins, R. N. "Correcting Public Opinion Concerning Infantile Paralysis and Its Relation to Swimming Pools and Beaches." *Beach & Pool.* XII: (Mar. 1938), 12.

"Rental and Rescue Value of Surf Boards." *Beach & Pool.* XII: (Dec. 1938), 13.

Russell, D. B. "A Successful Swimming Pool for a Town of 10,000." *Amer. City.* LIII: (Apr. 1938), 89.

"San Francisco Fair Plans Novel Pool." *Beach & Pool.* XII: (Sept. 1938), 5.

Struve, W. A. Von. "1,000,000 Gallon Swimming Pool." *Beach & Pool.* XII: (Dec. 1938), 8.

Swimming Pool Data, and Reference Annual. (New York: Hoffman-Harris 1938), 220 pp. $3.00 (pa.).

Wood, C. W. "Own Your Own Swimmin' Hole." *Country Life & Sportsman.* LXXIV: (May 1938), 80.

Wood, H. "Communicable Disease Control in Relation to Swimming Pools." *Beach & Pool.* XII: (July 1938), 13; (Aug. 1938), 10.

Zellers, E. V. "Latest Analysis of the Ammonia-Chlorine Water Treatment." *Beach & Pool.* XII: (Jan. 1938), 13.

ATHLETICS, SPORTS, OUTDOOR ACTIVITIES

"Are Leading Sportsmen Good Losers? Outstanding Critics Say 'No.'" *World Sports.* VI (Dec. 1938), 36.

"British Empire Games of 1938." *World Sports.* IV: (Jan. 1938), 102; V: (Oct. 1938), 195.

Burrows, C. T. *Modern Bowls.* (London: Vinton & Co., Chancery Lane, 1938), $0.25.

Butler, G. M. *Athletics and Training.* (New York: Scribner's, 1938), 254 pp. $2.00.

Cavins, H. M. "A Study to Discover the Relative Numbers of Baseball Games Won at Home and Away from Home in the Major Leagues." Res. Quar. IX: (Dec. 1938), 57.

"Cycling for Health." *World Sports.* V: (Oct. 1938), 204.

Field Hockey Guide 1938. (New York: Am. Sports, 1938), $0.25.

Gavit, J. P. "Fair Play, in Football and So On." *Recreation.* XXXI: (Feb. 1938), 648.

Handbook on Athletics. (Public Schools of Baltimore, Maryland, 1938), $0.25. (Pamphlet)

Hines, C. "Is the Athletic Coach a Teacher?" *Am. School Board Jr.* XCVI: (May 1938), 51.

Holmes, G. "Training Habits of High School Boys." *Ath. Jr.* XIX: (Sept. 1938), 36.

Hotchkiss, F. *Game of Bowls.* (Toronto: Ryerson Press, 1937), 144 pp. $1.75.

Houblon, D. A. *Side-Saddle.* (New York: Scribner's, 1938), 116 pp. $5.00.

Hughes, P. "Sport." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 203.

Hughes, W. L. *The Book of Major Sports.* (New York: Barnes, 1938), 396 pp. $3.00.

Kaese, H., *et al. Famous American Athletes of Today.* (Sixth Series.) (Boston: L. C. Page & Co., 1938), 407 pp. $2.50.

Lamar, E. *Athletic Plant.* (New York: McGraw, 1938), 302 pp. $3.00.

Lamb, A. S. "Sanity in Sports." *World Sports.* V: (June 1938), 61.

LaViness, W. T. "Its an Old Indian Pastime." (Lacrosse) *Chris. Sci. Mon. Mag.* (June 15, 1938), 5.

Lehman, H. C. "The Most Proficient Years at Sports and Games." Res. Quar. IX: (Oct. 1938), 3.

Little, A. W. "Polo from the Near-Side." *Country Life & Sportsman.* LXXIII: (Jan. 1938), 50; (Feb. 1938), 76; (Mar. 1938), 67; (Apr. 1938), 48; LXXIV: (May 1938), 70; (June 1938), 56; (July 1938), 43; (Aug. 1938), 64; (Sept. 1938), 50; (Oct. 1938), 56; LXXV: (Nov. 1938), 82; (Dec. 1938), 81.

Mason, B. S. *Primitive and Pioneer Sports.* (New York: Barnes, 1937), 342 pp. $2.50.

Milford, D. S. *Hockey* (Field). (Toronto, 1938), 228 pp. $2.00.

"National Fitness Council Notes." *World Sports.* IV: (Jan. 1938), 28.

"Nervousness is an Asset on the Field of Sport." *World Sports.* VI: (Dec. 1938), 44.

Newport, M. F. *Individual Sports*

Guide: Archery, Tennis, Riding and Golf. (New York: Barnes, 1938), 95 pp. $0.25.

Nicolson, F. W. *Athletics at Wesleyan.* (History) (Middletown, Conn.: University Alumni Council, 1938), 212 pp. $2.00.

"Olympic Games; Why Not Give Them a Fair Deal?" *World Sports.* V: (Oct. 1938), 193.

Pederson, J. "The Coach Widens His Campus Influence." *Ath. Jr.* XVIII: (June 1938), 41.

Pelham, H. "Physical Fitness and the University Student." *World Sports.* V: (July 1938), 101.

"Physical Exercises of Games." *World Sports.* V: (Oct. 1938), 219.

Sheehan, J. "Pictures an Aid in Coaching Fundamentals." *Ath. Jr.* XVIII: (Apr. 1938), 26.

"Sport in the Royal Navy." *World Sports.* V: (July 1938), 96.

"Swiss Enthusiasm for 'Hornuss'—Medley of Cricket, Golf and Tennis." *World Sports.* IV: (Feb. 1938), 116.

Taliaferro, P. "The High School Coach as a Counselor." *Ath. Jr.* XIX: (Nov. 1938), 34.

Webster, F. *Coaching and Care of Athletes.* (Toronto: Oxford University Press, 1938), 448 pp. $3.50.

Webster, J. and P. "Is This Why the Finns Succeed?" *World Sports.* IV: (May 1938), 20.

Wells, C. "Fundamental Training." *Ath. Jr.* XIX: (Nov. 1938), 6.

Administration, Organization, etc.

Allen, A. A. "Administrative Problems of Varsity and Intramural Athletics in Secondary Schools." (Grad. Thesis, Springfield College, 1938), 83 pp.

Dasovic, D. B. "Intramurals in a Rural School." *Ath. Jr.* XIX: (Oct. 1938), 28.

de Lacey, E. "The Part Played by Intramurals in the Development of a State Championship Team." *Ath. Jr.* XIX: (Oct. 1938), 22.

Edgren, H. D. "Sports in Light." *Jr. Health & Phys. Ed.* IX: (June 1938), 378.

Ellsbury, C. D. "The Coordination of Intramural and Interscholastic Athletics." *Ath. Jr.* XIX: (Sept. 1938), 34.

Galligan, G. E. "The Status of Intramural Athletics for Men in State Teachers Colleges." RES. QUAR. IX: (May 1938), 58.

Green, E. W. "Why Not More Intramural Sports?" *Ath. Jr.* XIX: (Nov. 1938), 28.

Griffith, J. L. "Are College Athletics Commercial and is it Necessary to Subsidize Athletes to Produce a Winning Team?" *Ath. Jr.* XIX: (Nov. 1938), 14.

Hart, C. "A Student Management System in Intercollegiate Athletics." *Ath. Jr.* XVIII: (May 1938), 32.

Huntington, E. V. "A Paradox in the Scoring of Competing Teams." *Science.* LXXXVIII: (Sept. 23, 1938), 287.

Morneweck, C. D. "Are Secondary-School Athletics and Publications Financial Assets or Liabilities?" *Am. School Board Jr.* XCVI: (May 1938), 45.

"National Fitness Grants to Universities and University Colleges." *World Sports.* V: (June 1938), 74.

Noble, V. J. "Balancing the School Budget with a Circus." *Ath. Jr.* XVIII: (Jan. 1938), 18.

Russell, N., and Lange, E. "An Experiment in Interschool Competition." *Jr. Health & Phys. Ed.* IX: (June 1938), 378.

Salter, A. H. "An Intramural Sports Handbook." *Ath. Jr.* XIX: (Nov. 1938), 28.

Schultz, F. G. "Administering the Athletic Program in the Small High School." *Am. School Board Jr.* XCVII: (Oct. 1938), 47.

"Tabulation by States Showing Sports Activities." *Ath. Jr.* XVIII: (June 1938), 30.

"Taxes on Athletic Games of State Institutions." *Sch. & Soc'y.* XLVII: (Jan. 8, 1938), 43.

Wegner, F. R. "The New York Athletic Protection Plan." *Jr. Health & Phys. Ed.* IX: (Feb. 1938), 106.

"What Change to Metric System Would Cost Commerce and Sport." *World Sports.* IV: (Feb. 1938), 124.

White, R. A. "Balancing the Budget." *Ath. Jr.* XVIII: (Jan. 1938), 32.

Archery

Harman, J. "Twentieth Century Robin Hoods." *Can. Mag.* XC: (Oct. 1938), 47.

Kennett, D. P., and Fecheimer, R. "Bull's Eye for Health," *Hygeia.* XVI: (Oct. 1938), 875.

Miller, M. K. "Archery in the Recreation Program." *Recreation.* XXXII: (July 1938), 329.

Ostrander, L. "Archery in School Physical Education and Community Program." *Ath. Jr.* XVIII: (June 1938), 44.

Baseball

Allen, E. N. *Major League Baseball.* (New York: Macmillan, 1938), 253 pp. $3.00.

Coombs, J. W. *Baseball—Individual Play and Team Strategy.* (New York: Prentice-Hall, 1938), 278 pp. $2.00.

DeGroat, H. S. "A Baseball Clinic's High Points." *Ath. Jr.* XVIII: (Apr. 1938), 36.

——— "Data That Will Aid the Baseball Coach." *Ath. Jr.* XVIII: (Mar. 1938), 20.

——— *The Baseball Coach's Kit.* (Springfield, Mass.: Author, 1938) $1.65. (18 booklets in case).

Gargan, J. E. "Pitching Fundamentals for the School-boy." *Ath. Jr.* XVIII: (May 1938), 11.

Jessee, D. E. "Running Bases." *Ath. Jr.* XVIII: (Apr. 1938), 5.

Sheehan, J. "Play of the Infield." *Ath. Jr.* XVIII: (May 1938), 13.

Treat, R. "The Use I Have Made of the Athletic Journal in My Pitching." *Ath. Jr.* XVIII: (June 1938), 26.

Basketball

Allen, F. C. *Better Basketball.* (New York: McGraw-Hill, 1938), 490 pp. $4.00.

"Basketball Ethics for Coaches." *Ath. Jr.* XIX: (Sept. 1938), 30.

Brickey, F. "A Co-ordinating Basketball Program." *Ath. Jr.* XIX: (Oct. 1938), 44.

Browning, W. "Basketball: A Phenomenal Rise to Popularity." *World Sports.* VI: (Nov. 1938), 22.

Burns, G. L. "Unorthodox Defensive Play." *Ath. Jr.* XVIII: (Feb. 1938), 11.

Carlson, H. C. *Basketball.* (New York: Funk & Wagnalls, 1938), 189 pp. $2.00.

Coombs, F. C. "A Basketball Sports Council." *Recreation.* XXXII: (Sept. 1938), 353.

Edmundson, C. S. "The One-Hand Push Shot." *Ath. Jr.* XVIII: (Jan. 1938), 7.

Fay, P. J., and Messersmith, L. L. "The Distance Traversed by College and High School Basketball Players and Effect of Rule Changes upon Distance Traversed in College Games." *Ath. Jr.* XVIII: (May 1938), 37.

——— "The Effect of Rule Changes upon the Distance Traversed by Basketball Players." RES. QUAR. IX: (May 1938), 136.

Few Scoring Plays of 1938. *Ath. Jr.* XVIII: (Feb. 1938), 10.

Gibble, A. T. "An Individual Basketball Rating Chart." *Ath. Jr.* XIX: (Oct. 1938), 26.

Healey, W. A., and Wells, C. "Play Without the Center Jump: Play in the Back Court. A Rushing Back Court Defense." *Ath. Jr.* XVIII: (Feb. 1938), 7.

"Is Basketball Too Strenuous?" *Ath. Jr.* XIX: (Nov. 1938), 36.

Kitchen, H. "Team and Coach Cooperation in Basketball." *Ath. Jr.* XIX: (Nov. 1938), 10.

May, C. R. "Deception in Basketball." *Ath. Jr.* XVIII: (Jan. 1938), 37.

McElroy, G. A. "Championship Basketball in the Small High School." *Ath. Jr.* XVIII: (Jan. 1938), 34.

——— "A Review of the Fundamentals that Contribute to Championship Basketball." *Ath. Jr.* XIX: (Nov. 1938), 10.

Tracy, J. B. "The Physical Condition of Basketball Players." *Ath. Jr.* XIX: (Nov. 1938), 30.

Wakefield, N. C., and Masters, A. B. "Suggestions from Indiana Basketball Coaches: Backboard Play. The Fast-Break Offense." *Ath. Jr.* XVIII: (Jan. 1938), 8.

Wells, C. "Comments on the Changes in

the 1938 Basketball Rules." *Ath. Jr.* XIX: (Sept. 1938), 19.

"What They're Saying About Basketball without the Center Jump." *Ath. Jr.* XVIII: (Feb. 1938), 5.

Wright, R. D. "Should Basketball Teams Be Rated?" *Ath. Jr.* XVIII: (May 1938), 42.

Cricket

"Birthplace of Cricket." *World Sports.* V: (July 1938), 88.

Hader, B. & E. *Cricket.* (New York: Macmillan, 1938), 159 pp. $2.00.

Football

Cooper, G. S. "Teaching Football to the Individual." *Ath. Jr.* XVIII: (June 1938), 23.

Dawson, L. P., and Gardner, F. E. "Timely Football Suggestions: Quarterbacking." L. P. Dawson. "The Explanation of Football Rules That Captains in Particular Should Know." F. E. Gardner. *Ath. Jr.* XVIII: (Mar. 1938), 28.

Eastwood, J. "Sports of the World—American Football." *World Sports.* V: (Oct. 1938), 200.

Epler, S. "Intramural Six-Man Football." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 430.

——— *Six-Man Football.* (New York: Harpers, 1938). 251 pp. $3.00.

——— *Six-Man Football.* (New York: University Publishing Co.) (Pamphlet) $0.20.

"Football Offense in the Colleges in 1938." *Ath. Jr.* XIX: (Nov. 1938), 11.

"Football Offense of 1938 in the High Schools." *Ath. Jr.* XIX: (Nov. 1938), 15.

Graf, W. I. "Practice Equipment for the Shifting Offences." *Ath. Jr.* XIX: (Oct. 1938), 14.

Haas, M. L. "Six-Man Football Revives the Village." *Nation's Bus.* XXVI: (Nov. 1938), 27.

Hamilton, T. J. "Place-Kicking and Drop-Kicking." *Ath. Jr.* XIX: (Sept. 1938), 22.

Holt, R. "The Notre Dame System in High School." *Ath. Jr.* XIX: (Sept. 1938), 7.

"How Best to Excel at Your Game: Rugby Football." *World Sports.* VI. (Nov. 1938), 6.

Howard, G. W. *A Measurement of the Achievement in Motor Skills of College Men in the Game Situation of Basketball.* (New York: Bureau of Publications, Teachers College, Columbia University, 1937), 109 pp. $1.60.

Jones, C. "Rugby Football." *World Sports.* IV: (Jan. 1938), 90; (Feb. 1938), 132.

Kern, C. C. "Suggestions for Unifying the High School Offense and Defense." *Ath. Jr.* XIX: (Sept. 1938), 15.

Kilburn, J. M. *In Search of Rugby Football.* (Philadelphia: Saunders, 1938), 174 pp. $1.50.

Larson, A. W. "Defensive and Offensive Formations in Six-Man Football." *Ath. Jr.* XIX: (Sept. 1938), 11.

——— "Six-Man Football." *Ath. Jr.* XVIII: (June 1938), 40.

——— "Six-Man Football Formations on the Kick-off." *Ath. Jr.* XIX: (Oct. 1938), 15.

Lenser, K. W. "Six-Man Football Defensive Strategy." *Ath. Jr.* XIX: (Oct. 1938), 16.

——— "Spread Formation in Six-Man Football." *Ath. Jr.* XIX: (Sept. 1938), 10.

Macdonald, H. F., and Rees, J. L. *Rugger Practice and Tactics.* (Toronto, Canada: Macmillan (Agents) 1938), 141 pp. $1.00.

MacDowell, G. "A Use of Six-Man Football in the Large High Schools." *Ath. Jr.* XIX: (Oct. 1938), 42.

Magoun, F. P. *History of Football from the Beginnings to 1871.* (New York: Stechert, 1938), 151 pp. $2.80.

Merrell, R. R. "Individual Football Rating System." *Ath. Jr.* XIX: (Sept. 1938), 13.

Miller, L. L. B. "Relay-Shift Huddle." *Ath. Jr.* XIX: (Sept. 1938), 32.

Pittman, M. S. "Football—Sport or Spoils?" *Sch. & Soc'y.* XLVIII: (Aug. 13, 1938), 213.

"Quarterback Strategy." *Ath. Jr.* XIX: (Nov. 1938), 5.

Ross, N. C. "Quarterbacking in the Huddle." *Ath. Jr.* XIX: (Sept. 1938), 24.

"Seventeenth Annual Meeting of the

American Football Coaches Association." *Ath. Jr.* XVIII: (Feb. 1938), 34.

Skillern, G. "Importance of Fundamentals and How to Teach Them to High School Boys." *Ath. Jr.* XIX: (Oct. 1938), 17.

Snavely, C. "Observations on Recent Developments in the Defense." *Ath. Jr.* XIX: (Oct. 1938), 12.

Stevens, M., and Shorten, H. *How to Watch a Football Game.* (New York: Leisure League, 1937), 75 pp. $1.00.

Stuhldreher, H. "The Notre Dame System Versus the Single Wing-Back." *Ath. Jr.* XIX: (Oct. 1938), 8.

"Survey of Night Football in Alabama." *Ath. Jr.* XIX: (Sept. 1938), 18.

Waldorf, L. O. "Some Trends in Single Wing-Back Offense." *Ath. Jr.* XIX: (Oct. 1938), 5.

Wilkins, E. H. "College Football Costs." *Sch. & Soc'y.* XLVII: (Mar. 1938), 381.

Wilson, B. E. "A Survey of Night Football in the Secondary Schools of Kentucky." *Ath. Jr.* XIX: (Oct. 1938), 36.

Golf

Alway, L. K. "Indoor Group Golf Instruction." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 38.

Davis, J. E. "Golf." *Hygeia.* XVI: (Apr. 1938), 305.

Forrest, J. *Natural Golfer: Hand Action in Games.* (New York: Dutton, 1938), 97 pp. $3.00.

Jones, R. T. "Freedom in the Swing." *Golf.* II: (Dec. 1938), 18.

Little, L. "Does Your Stance Give You a Chance?" *Golf.* II: (June 1938), 25.

——— "Fundamentals of the Back Swing." *Golf.* II: (Aug. 1938), 18.

Rehbock, F. W. "That's the Shot!" *Recreation.* XXXII: (Oct. 1938), 405.

Rice, G. "Art of Putting." *Golf.* II: (Apr. 1938), 21.

——— "Faults, Habits, Cures." *Golf.* II: (May 1938), 18.

——— "Golf's Winning Factors." *Golf.* II: (Sept. 1938), 27.

——— "Groovin' 'Em." *Golf.* II: (July 1938), 31.

Servos, L. C. *Practical Instruction in Golf.* (Emans, Pa.: Rodale Pub., 1938), 175 pp. $2.00.

Snead, S. *Quick Way to Better Golf.* (New York: Sun Dial Press, 1938), $1.00 (pa.).

S. W. M. "Golf and the Golfer." *Amer. Lawn Tennis.* XXXII: (Dec. 1938), 42.

Soccer

Referees' Chart and Players' Guide, 1938–39. The Football Association. (London: Evans Brothers, 1938), 48 pp. $0.25.

Rudd, C. T., and Withum, E. M. *Association Football for Boys.* (Toronto, Canada: Musson (agents) 1937), $0.50.

Stewart, D. (Editor). *Official Soccer Football Guide, 1938–39.* (New York: Am. Sports, 1938), 110 pp. $0.25.

Tennis, Squash, Badminton

"American Impressions." *Am. Lawn Tennis.* XXXI: (Jan. 20, 1938), 22.

Brain, P. "Tactics in Tennis Doubles." *Ath. Jr.* XVIII: (Apr. 1938), 10.

Bruce, E. S. and B. O. *Tennis: Fundamentals and Timing.* (New York: Prentice-Hall, 1938), 116 pp. $2.50.

Deed, N., and Hynson, R. C. "American Sweep at Wimbledon." *Am. Lawn Tennis.* XXXII: (July 1938), 4.

Hawley, D. "The Outlook in Eastern Tennis." *Am. Lawn Tennis.* XXXI: (Mar. 1938), 44.

Hindman, D. A. "A Note on Doubles Play." *Ath. Jr.* XVIII: (Apr. 1938), 38.

Hughes, G. P. "British Prospects." *Am. Lawn Tennis.* XXXI: (Mar. 1938), 46.

Jackson, C. H., and Swan, L. A. *Badminton Tips.* (Detroit: Sport Tips and Teaching Aids, 1938), 15 plates. $3.00.

Lambert, E. "The Development of Young Tennis Players." *Ath. Jr.* XVIII: (Mar. 1938), 32.

——— "Side Lights on Tennis Fundamentals." *Ath. Jr.* XVIII: (May 1938), 20.

Lockhart, A. "Survey of Tennis Tests." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 433.

Lott, G. "Tight Spots in Tennis." *At-*

lantic Monthly. CLXII: (Aug. 1938), 196.

Noel, S. *Squash Rackets*. (Toronto, Canada: Ryerson Press, 1937), $1.75.

Tilden, W. T. *Aces, Places and Faults*. (Toronto, Canada: Ryerson Press (agents) 1938), $3.75.

Vines, E. *How to Play Better Tennis*. (Toronto, Canada: Musson (agents) 1938), $1.25.

Wheldon, N. "Grass Comes to California." *Am. Lawn Tennis*. XXXII: (Dec. 1938), 15.

Track and Field

Baskin, W. O., Jr. "Training for the High Hurdles." *Ath. Jr.* XVIII: (Mar. 1938), 8.

Bohm, W. H. S. "Opinions of Experienced Coaches and Athletes on Training Track and Field Athletes." (Grad. Thesis, Springfield College, 1938, 180 pp.)

Cozens, F. W. "A Fall Decathlon for Track Squads." RES. QUAR. IX: (May 1938), 3.

Cromwell, D. "Training for the Pole Vault." *Ath. Jr.* XVIII: (May 1938), 5.

Drenckpohl, V. W. "Creating Interest in Track in a Small High School." *Ath. Jr.* XVIII: (Mar. 1939), 19.

Dyson, C. N. G. "The Mechanics of High Jumping." *World Sports*. VI: (Dec. 1938), 60.

Footrick, W. "Analysis of Javelin Throwing." (Grad. Thesis, Springfield College, 1938, 99 pp.)

Hayes, E. C. "Early Conditioning for Track and Field." *Ath. Jr.* XVIII: (Feb. 1938), 13.

Hill, F. "Training for the 220-Yard Dash." *Ath. Jr.* XVIII: (Apr. 1938), 18.

Hoyt, C. B. "Training for the 100-Yard Dash." *Ath. Jr.* XVIII: (Mar. 1938), 13.

Jones, T. "Development of Milers." *Ath. Jr.* XVIII: (Feb. 1938), 14.

Kinsey, D. "Observing Hurdle Clearance." *Ath. Jr.* XVIII: (May 1938), 17.

Lowe, D. G. A. "Track and Field Athletics." *World Sports*. IV: (Apr. 1938), 198; (May 1938), 14; V: (June 1938), 54; (July 1938), 93.

Mach, J. "Building International Friendship through Track and Field." *Ath. Jr.* XVIII: (Mar. 1938), 39.

Newton, A. F. H. "Cross Country Considerations." *World Sports*. IV: (Feb. 1938), 138.

Novak, L. "The New Track and Athletic Field at West Point." *Ath. Jr.* XVIII: (Mar. 1938), 5.

Official Intercollegiate Track and Field Guide. (New York: Am. Sports, 1938), $0.25.

Olson, C. "Training for the 880-Yard Run." *Ath. Jr.* XVIII: (Apr. 1938), 19.

Phillips, H. "The Low Hurdles." *Ath. Jr.* XVIII: (May 1938), 6.

Ryan, M. "Javelin Throwing." *Ath. Jr.* XVIII: (Mar. 1938), 14.

Schlademan, K. A. "Training for the 440-Yard Run." *Ath. Jr.* XVIII: (Feb. 1938), 15.

Schulte, H. F. "Training for the Shot Put." *Ath. Jr.* XVIII: (Mar. 1938), 7.

Snyder, L. N. "Working with High Jumpers." *Ath. Jr.* XVIII: (May 1938), 8.

Staley, R. "Hurdling." *World Sports*. V: (July 1938), 98.

Wagner, C. J. "Organization and Procedure in the Conduct of Track and Field Meets." (Doctor's Thesis, New York University, 1937, 118 pp.)

Weede, G. W. "The Development and Training of Broad Jumpers. *Ath. Jr.* XVIII: (Apr. 1938), 13.

Wilson, K. L. *National Collegiate Athletic Association Official Track and Field Guide*. (New York: Am. Sports, 1938), 119 pp. $0.25.

CALISTHENICS, GYMNASTICS, INDOOR ACTIVITIES

Atwel, A. A. "A Different Approach to Tumbling and Stunts." *Jr. Health & Phys. Ed.* IX: (Mar. 1938), 142.

Broman, A. "Recreative Gymnastics: Some Technical Points." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (July 1938), 99.

Clapp, R. G. *Wrestling Rules, 1938–39*. (New York: Am. Sports, 1938), 121 pp. $0.25.

Clark, C. *Table Tennis.* (New York: Prentice-Hall, 1938), 109 pp. $1.60.

Coote, B. T. "Science or Sciolism in Gymnastics." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Nov. 1938), 192.

Dummett, P. "The Principles of Medau Rhythmic Gymnastics." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Mar. 1938), 47.

Fleming, E. "Swedish-Ling Gymnastics of To-day." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Mar. 1938), 51.

Hett, G. V. "Fencing: An Insidious Evil." *World Sports.* IV: (Feb. 1938), 114.

Kuwashima, T. S., and Welch, A. R. *Judo.* (New York: Prentice-Hall, 1938), 119 pp. $2.50.

LaPorte, W. R., and Renner, A. *The Tumbler's Manual.* (New York: Prentice-Hall, 1938), 122 pp. $3.00.

Lottinville, A. J. "A Bibliography on Boxing." RES. QUAR. IX: (Oct. 1938), 129.

McVicar, J. W. *The 1938 Edition of 30 Successful Clown Acts.* (Toronto, Canada: Central Y.M.C.A., 1938), $1.00.

Morgan, R. E. "An Examination of the Value of Sports Gymnastics." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (July 1938), 127.

Philips, B. E. "Bringing Handball up to Date." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 222.

——— *Fundamental Handball.* (New York: Barnes, 1938), 124 pp. $1.50.

Price, H. D. "Elementary Balancing and Tumbling." *Jr. Health & Phys. Ed.* IX: (Feb. 1938), 100.

——— "Advanced Handbalancing." *Ath. Jr.* XVIII: (Jan. 1938), 13.

——— "Fundamentals of Doubles Handbalancing." *Ath. Jr.* XVIII: (Feb. 1938), 28.

——— "Handbalancing Routines." *Ath. Jr.* XVIII: (Mar. 1938), 16.

"Reports on Swedish Olympic Gymnasts' Demonstration, London, March, 1938." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (July 1938), 109.

Riley, H. R., Jr. (Editor). *Official Boxing Rules, 1939.* (New York: Am. Sports, 1939), 62 pp. $0.25.

Tibbels, A. *The Circus Comes to School: A Plan Whereby the Circus Becomes Recreational and Educational.* (New York: Barnes, 1938), 242 pp. $2.50.

Thulin, J. G. *Gymnastic Atlas.* (London: Simpkin Marshall, 1938), 315 pp. 10s. 6d.

——— *New Swedish Gymnastic Picture-Atlas.* (London: Simpkin, 1938), 7s. 6d.

Vince, J. *Fundamentals of Foil Fencing.* (New York: Joseph Vince, 1937), 53 pp. $1.00.

Wilde, J. *Fighting was my Business.* (Boxing) (Philadelphia: Saunders (agents), 1938), 284 pp. $5.00.

Wilson, S. "Sports—Gymnastics in Physical Training." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (July 1938), 123.

CAMPING

Allen, A. F. "Safeguarding Health in New York's Camps." *Camping Mag.* X: (Nov. 1938), 9.

Beck, M. H. "The Day Camp." *Jr. Health & Phys. Ed.* IX: (June 1938), 353.

Blair, D. "The Shadow Compass." *Field & Stream.* XLIII: (Oct. 1938), 91.

Blair, M. H. "Music of Nature." *Camping World.* IV: (Apr. 1938), 15.

——— "Nature Goes on the Stage." *Camping World.* IV: (May 1938), 17.

——— "Nature in the Craft Shop." *Camping World.* IV: (Dec. 1938), 14.

Brown, R. A. "A Chart of a Salt Water Camp for Girls." *Camping Mag.* X: (Nov. 1938), 16.

Bunting, J. E., Jr. "Candid Camera and Camp Year-Books." *Camping Mag* X: (Feb. 1938), 4.

"Camp Pow-Wow." *Camping World.* IV: (May 1938), 19.

"Camping Movement." *Camping World.* IV: (Mar. 1938), 17.

Cline, J. "Hikers Bikers and Riders." *Nation's Schools.* XXI: (Feb. 1938), 18.

Dearolf, S. "Poetry for Boys." *Camping Mag.* X: (Nov. 1938), 21.

——— "We'll Build Us a House." *Camping Mag.* X: (June 1938), 21.

Dryden, M. L. "Neighborhood Day Camping in New York City." *Recreation.* XXXII: (May 1938), 79.

Du Bois, G. "Week-End Camping." *Camping World*. IV: (Jan. 1938), 8.

Elliott, C. N. "Wilderness Food." *Field & Stream*. XLIII: (May 1938), 40.

Emmett, J. "Cooking Wild Duck." *Field & Stream*. XLIII: (Dec. 1938), 73.

——— "Don't Forget the Tarpaulin." *Field & Stream*. XLIII: (July 1938), 64.

Grimshaw, W. M. "The Place of the Day Camp in Modern Life." *Recreation*. XXXII: (Aug. 1938), 279.

Hall, E. T. "What's New in Handicrafts?" *Camping World*. IV: (Apr. 1938), 14.

Hancock, E. A. "Dressing a Rabbit." *Field & Stream*. XLIII: (Dec. 1938), 72.

Harlow, W. M. "Shall We Use White Birch Bark?" *Camping Mag*. X: (Nov. 1938), 14.

Holmes, C. A. "Winter Camps." *Jr. Phys. Ed. & Sch. Hyg*. XXX: (July 1938), 137.

Hosmer, P. "Grills and Outdoor Stoves." *Field & Stream*, XLIII: (Aug. 1938), 66.

Hurley, R. J. *Key to the Out-of-Doors*. (New York: H. W. Wilson Co. 1938), 256 pp. $0.50.

Jaeger, E. "Woodcraft Ways." *Camping Mag*. X: (Jan. 1938), 27.

Jessup, E. "Toting Your Kit." *Field & Stream*. XLIII: (May 1938), 84.

Joy, B. E. "Outdoor Cookery for Large Groups." *Camping Mag*. X: (Mar. 1938), 12.

——— "Progressive Suppers." *Camping Mag*. X: (Apr. 1938), 18.

——— "When the Camp Cooks Out." *Camping Mag*. X: (May 1938), 18.

Kodis, V. S. "Study of Day Camping in the Vicinity of Springfield, Mass." (Grad. Thesis, Springfield College, 1938, 123 pp.)

Kemp, R. H. "Back to Nature in Crafts." *Camping Mag*. X: (June 1938), 10.

Kreider, C. M. "A Pack Hitch You Can Remember." *Field & Stream*. XLIII: (Oct. 1938), 90.

Mandelstam, A. "What a Little Fellow Does for a Big Fellow and Vice Versa." *Camping Mag*. X: (Nov. 1938), 11.

Marshall, R. C. "Borings, Turnings, and Shavings." *Camping World*. IV: (May 1938), 13.

Nevens, R. W. "Survey and Evaluation of the Y.M.C.A. Summer Home Vacation Camps in New Jersey." (Grad. Thesis, Springfield College, 1938, 60 pp.)

Parker, B. R. "Campfire." *Leisure*. V: (Aug. 1938), 27.

Ransom, E. "Frying-Pan Blues." *Field & Stream*. XLIII: (Nov. 1938), 26.

Salomon, J. H. "Camping Trends and Public Areas." *Camping Mag*. X: (Oct. 1938), 16.

Seydel, H. "The Control of Aquatic Plant Life." *Camping World*. IV: (Apr. 1938), 17.

Snyder, G., and Loomis, C. F. *The Outdoor Book*. (New York: Camp Fire Outfitting Co., 1938), (Pamphlet) $0.50.

Titus, H. "The Old Warden on Food Supplies," *Field & Stream*, XLIII: (Aug. 1938), 26.

Vinal, W. G. "Forestry for Organized Camps." *Camping Mag*. X: (Apr. 1938), 5.

——— "Water Conservation in Camps." *Camping Mag*. X: (May 1938), 11.

Werner, M. "The Trouble Maker." *Camping Mag*. X: (Feb. 1938), 23.

Williams, L. "Camp Weather Bureaus." *Camping Mag*. X: (June 1938), 7.

——— "Meteor Counting is Fun." *Camping Mag*. X: (May 1938), 12.

Wirth, C. L. "The National Park Service." *Camping World*. IV: (Mar. 1938), 4.

Trailers, Trailer Camping

Clark, C. D., and Wilcox, C. E. "The House Trailer Movement." *Sociol. & Soc. Research*. XXII: (July-Aug. 1938), 503.

Edmund, W. H. "Trailer Units for the Recreation Program." *Recreation*. XXXII: (July 1938), 216.

Kimball, W. A., and Larned, W. L. *The Trailer for Pleasure and Business*. (New York: McGraw-Hill, 1937), 236 pp. $2.50.

Kirby, K. "Little Trailers for Big Trips."

Field & Stream, XLIII: (Aug. 1938), 67.

Klein, H. C. "Regulating House Trailers and Camps." *Amer. City*. LIII: (Aug. 1938), 61.

Lovett, W. P. "School Accommodations for Trailer Children." *Amer. City*. LIII: (Sept. 1938), 17.

MacDowell, S. *We Live in a Trailer*. (New York: Julian Messner, 1938), 244 pp. $2.00.

Outland, G. E. "Auto Caravan and Youth Transiency." *Sociol. & Soc. Res.* XXII: (July-Aug. 1938), 564.

"Uniform Codes the Way to Solve Trailer Problems." *Amer. City*. LIII: (Jan. 1938), 103.

Wilson, L., and Hoover, O. *Meals on Wheels: Trailer Housekeeping*. (New York: Modern Age, 1937), 168 pp. $1.00.

Activities, Programs, etc.

Berthold, B. "Summer Skiing on Pine Needles." *Camping Mag.* X: (June 1938), 15.

Blake, T. "Surfboards for Fun and Safety." *Camping Mag.* X: (June 1938), 9.

Bovbjerg, V. "A Project in Astronomy." *Camping Mag.* X: (June 1938), 18.

Buckley, B. "Casting—A New Camp Game." *Camping World*. IV: (Dec. 1938), 17.

Cheley, F. H. "Developing an Indigenous Camp Program." *Camping Mag.* X: (May 1938), 4.

——— *Little Camp Fires*. (Boston: W. A. Wilde Co., 1938), 248 pp. $1.50.

"Closing Night Reflections." *Camping Mag.* X: (Nov. 1938), 20.

Cole, D. H. "Camping and Woodcraft." *Field & Stream*. XLIII: (May 1938), 84; (June 1938), 80; (July 1938), 64; (Aug. 1938), 66; (Sept. 1938), 78; (Oct. 1938), 90; (Nov. 1938), 86; (Dec. 1938), 72.

Gibson, H. W. *Recreational Programs for Summer Camps*. (New York: Greenberg, 1938), 440 pp. $3.50.

Ginsberg, W. "The Camp Newspaper as a Vital Activity." *Camping Mag.* X: (Nov. 1938), 12.

Gray, C. "Evening Programs." *Camping World*. IV: (Mar. 1938), 15.

Hand, H. C. *Campus Activities*. (New York: McGraw-Hill, 1938), 357 pp. $3.00.

Hunt, W. B. *Indian and Camp Handicraft*. (Milwaukee: The Bruce Publishing Co., 1938), 80 pp. $2.00.

Longfellow, W. E. "Dramatizing the Camp Water Program." *Camping Mag.* X. (May 1938), 15.

McCormick, O. "Coastwise Cruising." *Camping Mag.* X: (May 1938), 8.

Raabe, Z. "Notes on Shrub and Tree Planting." *Camping World*. IV: (May 1938), 6.

Schrottky, O. "A Play Director Speaks for Dramatics." *Camping Mag.* X: (June 1938), 4.

Walsh, S. P. "Mountain Climbing." *Camping Mag.* X: (Apr. 1938), 6.

"Water Skiing." *Camping Mag.* X: (June 1938), 19.

Administration, Organization, etc.

Booth, L. N. "Camp Profits." *Camping World*. IV: (Dec. 1938), 8.

Braithwaite, H. G. "Camp Insurance Problems." *Camping Mag.* X: (Oct. 1938), 10.

Blumenthal, L. R. *Group Work in Camping*. (New York: Association Press, 1937), 100 pp. $1.25.

Caswell, J. E. "Camp Leadership." *Camping World*. IV: (Feb. 1938), 11.

Cheley, F. H. "The ABC's of a Successful Camp Director." *Camping Mag.* X: (Dec. 1938), 3.

——— "A Few Fundamentals for Boys' Counselors." *Camping Mag.* X: (Feb. 1938), 18.

Clayton, M. G., and Fargher, L. M. "Apprentice Counselors in Camp." *Camping Mag.* X: (Nov. 1938), 7.

Conlan, E. "Recruiting and Training a Staff for Y.M.C.A. Camps." *Camping World*. IV: (May 1938), 9.

Denniston, G. P. "The Parents Help the Director." *Camping Mag.* X: (Dec. 1938), 13.

Dorsett, M. "What Method of Behavior Recording Do You Use?" *Camping Mag.* X: (Nov. 1938), 23.

Drought, R. A. "The Record-Keeping Bugaboo." *Camping Mag.* X: (Feb. 1938), 8.

Gore, H. M. "All-Year-Round Use of

Our Summer Camps." *Camping Mag.* X: (Jan. 1938), 14.

——— "Visual Measurement of Development in Camping Skills." *Camping Mag.* X: (Dec. 1938), 12.

"Guidance in the Modern Summer Camp." *Camping Mag.* X: (Mar. 1938), 26.

Hildebrand, J. H. *Camp Catering, or How to Rustle Grub.* (Brattleboro, Vt.: Stephen Daye Press, 1938), 87 pp. $1.25.

Hoover, G. E. "Foreign Counselors for American Camps." *Camping Mag.* X: (Apr. 1938), 26.

Hyde, E. A. *Army Mess Management Simplified.* (Huntington, W. Va.: Standard Printing and Publishing Co., 1938), 197 pp. $2.00.

Hymes, J. L., Jr. "Training for Guidance." *Camping Mag.* X: (Jan. 1938), 7.

Johanboeke, K. "Camping Problems Today—Previews of the 1939 Convention." *Camping Mag.* X: (Dec. 1938), 18.

Joy, B. E. "Menus for a Three-Day Trip." *Camping Mag.* X: (June 1938), 22.

——— "A Source of Counselor Material." *Camping Mag.* X: (Oct. 1938), 23.

Jones, R. T. "Something to Take Home." *Camping World.* IV: (June 1938), 11.

Klippel, C. H. *Individual Record Blank for Camp and Club.* (Hamilton, Ohio: C. H. Klippel, Y.M.C.A., 1938) 4 pp. 10 copies, $.50; 50 copies, $2.00; 100 copies, $3.25.

Lehman, A. "Camp Business Administration." *Camping Mag.* X: (Oct. 1938), 6.

Lenzer, H. "The Man Behind the Range." *Camping Mag.* X: (Mar. 1938), 11.

Marshall, R. C. "Dollars and Counselors." *Camping World.* IV: (Apr. 1938), 10.

McGarrigle, R. "Enrollment Promotion in the Private Camp." *Camping Mag.* X: (Nov. 1938), 3.

McGary, E. M. "Trained Leadership for the Waterfront." *Camping Mag.* X: (May 1938), 10.

Partridge, E. D. "Building a Camp Staff." *Camping World.* IV: (Apr. 1938), 8.

Robinson, O., and Munzer, M. "High School Students' Experiences in the Hudson Guild Summer Work Camp." *Prog. Educ.* XV: (Dec. 1938), 636.

"Sign on the Dotted Line." *Camping World.* IV: (Dec. 1938), 12.

"Significant Venture in Counselor Training." *Camping Mag.* X: (Dec. 1938), 20.

Sprague, J. P. "Court Decision Gives Public Use of Portage Trails." *Camping Mag.* X: (Mar. 1938), 19.

Stock, H. T. "Camp Insurance Problems." *Camping Mag.* X: (Mar. 1938), 16.

——— "Camp Insurance Problems." *Beach & Pool.* XII: (July 1938), 5.

"Summer Camps for the Underprivileged in England." *Sch. & Soc'y.* XLVIII: (Sept. 1938), 360.

Construction, Equipment, etc.

"Are Gang Showers Suitable for Girls?" *Camping Mag.* X: (Oct. 1938), 25.

Edgren, H. D. "Informal Game Equipment for Camps." *Camping Mag.* X: (June 1938), 26.

"Facts about Camp Silverware." *Camping World.* IV: (Dec. 1938), 22.

"Fire Protection Equipment for Organized Camps." *Camping Mag.* X: (Feb. 1938), 26.

Good, A. H. "Camp Layouts." *Camping Mag.* X: (Apr. 1938), 10.

Gore, H. M. "Winter-Proofing Your Camp Buildings." *Camping Mag.* X: (Feb. 1938), 16.

Hosmer, P. "Camp Cooking Outfits." *Field & Stream.* XLIII: (Sept. 1938), 78.

"Layouts for a Miniature Golf Course and Putting Course." *Camping World.* IV: (June 1938), 10.

Raabe, Z. "Notes on the Fenestration of Camp Buildings." *Camping World.* IV: (June 1938), 7.

"Re: Equipment and Supplies." *Camping Mag.* X: (May 1938), 23.

Scully, C. B. "Protecting Summer Camps from Fire." *Camping Mag.* X: (June 1938), 11.

Thompson, S. "Go Light, Young Man." *Camping Mag.* X: (May 1938), 14.

Whiteside, H. D. *An Appraisal of Camp Facilities.* (Pitsburgh, Pa.: Federation of Social Agencies of Pittsburgh and Allegheny County, Pittsburgh, Pa., 1938), (Pamphlet) $0.35.

Theory, Philosophy, etc.

Arnold, R. "One Good Picture is Better than a Thousand Words." *Camping World.* IV: (June 1938), 13.

Bentley, W. H. "The Camp and the Nearby Village." *Camping Mag.* X: (Apr. 1938), 21.

Blair, M. H. "Wanted! Trained Nature Counselors." *Camping World.* IV: (Mar. 1938), 13.

Booth, L. N. "Before It Is Too Late!" *Camping World.* IV: (Mar. 1938), 19.

——— "Teach Campers to Help Themselves!" *Camping World.* IV: (Feb. 1938), 14.

——— "This Camping Business." *Camping World.* IV: (Apr. 1938), 19.

Brown, R. A. "Colorful Camp Traditions." *Camping Mag.* X: (Mar. 1938), 6.

"Camping Education." *Phi Delta Kappan.* XXI: (Dec. 1938), 114.

Cheley, F. H. "I Went to Camp and Found God." *Camping Mag.* X: (Jan. 1938), 3.

Conant, E. M. "Summer Camp Goes into Winter Quarters." *Camping Mag.* X: (Oct. 1938), 3.

Conlan, E. "Legends and Traditions in Camp Life." *Camping World.* IV: (June 1938), 16.

Deaver, G. G., and Allen, A. F. "How's Your Health, Camper?" *Camping World.* IV: (Jan. 1938), 10.

Drought, R. A. "Mental Health in Camp." *Camping Mag.* X: (Apr. 1938), 3.

Drury, C. M. "The Good Counselor." *Camping Mag.* X: (June 1938), 3.

Dryden, M. L. "One More Member of the Camp Family." *Camping World.* IV: (Jan. 1938), 16.

Frasher, C. B. "College Camping Courses." *Camping Mag.* X: (Jan. 1938), 18.

Frey, E. M. "Young America Speaks." *Camping World.* IV: (Jan. 1938), 14.

Green, R. "After Camp—What?" *Camping Mag.* X: (Dec. 1938), 10.

Gutwilling, M. A. "Grow Your Own." *Camping Mag.* X: (Apr. 1938), 15.

Hart, T. A. "The Why of It All." *Camping Mag.* X: (Oct. 1938), 21.

Helmer, J. D. "Oh Camps, What are You Teaching?" *Camping World.* IV: (Feb. 1938), 9.

Hymes, J. L., Jr., "Why Restrict Progressive Education to the Campers?" *Camping Mag.* X: (Feb. 1938), 14.

"In Behalf of Counselors." *Camping Mag.* X: (May 1938), 22.

"Is There Carry-Over from Camp Experiences?" *Recreation.* XXXII: (Dec. 1938), 521.

Jordan, H. "A Few Camping Hints." *Camping Mag.* X: (June 1938), 16.

Joy, B. E. "Overnight Trips—Yes and No!" *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 208.

——— "Source of Counselor Material." *Camping Mag.* X: (Oct. 1938), 23.

Kephart, A. P. "The Results of Camping." *Camping Mag.* X: (Oct. 1938), 12.

Luther, R. M. "Outdoor Happiness for the Hard-of-Hearing." *Camping Mag.* X: (Dec. 1938), 15.

Marshall, R. C. "Else, Why Camping?" *Camping World.* IV: (Dec. 1938), 5.

——— "The Second Dementia of Camp Leadership." *Camping World.* IV: (Jan. 1938), 4.

——— "The Third Dementia of Camp Leadership." *Camping World.* IV: (Feb. 1938), 4.

——— "The Fourth Dementia of Camp Leadership." *Camping World.* IV: (Mar. 1938), 8.

McCarrigle, R. "I Wish I Could Visit Other Camps." *Camping Mag.* X: (Jan. 1938), 5.

Nash, J. B. "Concerning Camp—Some Philosophical Pointers." *Camping Mag.* X: (Feb. 1938), 3.

——— "Understanding the Camper." *Camping World.* IV: (May 1938), 4.

Moelk, J. W. "Inconvenience or Adventure." *Camping Mag.* X: (June 1938), 20.

Northway, M. L. "Extending Camp Horizons." *Camping Mag.* X: (Dec. 1938), 8.

Osborne, E. G. "Make Way for the

Parents." *Camping World*. IV: (Apr. 1938), 4.
Premer, G. W. "Building Fears in Camp." *Camping World*. IV: (May 1938), 11.
Richardson, F. H. "You and Your Child's Camp." *Hygeia*. XVI: (June 1938), 521; (July 1938), 588.
Ross, H. "What Can the Camp Contribute to the Emotional Development of the Child?" *Camping Mag*. X: (Mar. 1938), 3.
Sharp, L. B. "Camptivities and Character." *Camping World*. IV: (June 1938), 5.
Stephenson, O. W. "Crowfeather Goes to School." *Camping Mag*. X: Oct. 1938), 14.
Twining, H. H. "Camps of Fifty Years Ago." *Nation's Schools*. XXI: (Apr. 1938), 18.
——— "Camps of Today." *Nation's Schools*. XXI: (May 1938), 36.
——— "Camps of the Future." *Nation's Schools*. XXI: (June 1938), 37.
Van Aller, D. G. "Take Him to Camp." *Leisure*. V: (Apr. 1938), 10.
Van Dis, J. A. "In the Lifetime of One Man." *Camping Mag*. X: (May 1938), 21.
Vinal, W. G. "Conservative Education." *Camping Mag*. X: (Feb. 1938), 17.
——— "Top Soil—The Heart of Camping." *Camping Mag*. X: (Mar. 1938), 17.
——— "Wild-Life Management for Camps." *Camping Mag*. X: (June 1938), 13.
Wands, H. E. "Camp as a Continuing Experience." *Camping Mag*. X: (Oct. 1938), 8.
Williams, L. "Naturalist or Scientist—Which?" *Camping Mag*. X: (Jan. 1938), 10.
Zander, A. "A Study of the Behavior of Boy Campers." RES. QUAR. IX: (May 1938), 128.

DANCING, RHYTHMICS, PAGEANTRY

Alden, F. D. "The Dancer Holds the Key." *Ed Dance*. I: (Nov. 1938), 3.
Allen, P. S. "The Dance in Our Colleges." *Amer. Dancer*. XI: (July 1938), 21.
——— "Mecca for Moderns." *Amer. Dancer*. XI: (June 1938), 19.
Ballwebber, E. *Group Instruction in Social Dancing*. (New York: Barnes, 1938), 131 pp. $2.50.
Bayes, A. "Fencing—The Perfect Foil, for Dancing." *Amer. Dancer*. XI: (Jan. 1938), 28.
Bennett. G. T. *Field Routines for Marching Band Contests and Public Exhibitions*. (Chicago: Gamble, 1938), 35 pp. $1.00 pa.
——— *Street Routines for Marching Band Contests and Public Exhibitions*. (Chicago: Gamble, 1938), 35 pp. $1.00 pa.
Blasis, C. "The Code of Terpsichore." *Amer. Dancer*. XI: (Jan. 1938), 30; (Feb. 1938), 22; (Mar. 1938), 20; (Apr. 1938), 26; (May 1938), 28; (June 1938), 32; (July 1938), 32; (Aug. 1938), 24; (Sept. 1938), 24; (Oct. 1938), 22; (Nov. 1938), 25; (Dec. 1938), 30.
Burchenal, E. *Folk-Dances of Germany*. (New York: Schirmer, 1938), 127 pp. $2.00.
Butler, A. "The New Trend in Social Dance Instruction." *Jr. Health & Phys. Ed*. IX: (June 1938), 362.
Carpenter, A. "Square Dancing in College." *Recreation*. XXXII: (Dec. 1938), 511.
Christianson, H. *Body Rhythmic Movements of Young Children in Relation to Rhythm in Music*. (New York: Bureau of Publications, Teachers College, Columbia Univ., 1938), 196 pp. $2.10.
Dean, V. "Social Dancing for Fifth and Sixth Grades." *Jr. Health & Phys. Ed*. IX: (Apr. 1938), 220.
Deane, M. B. "What to Expect of a Summer Course." *Ed. Dance*. I: (June-July 1938), 3.
Dunkel, E. "Put Dancing in Its Place." *Jr. Health & Phys. Ed*. IX: (Sept. 1938), 418.
Haskell, A. *Dancing Around the World*. (New York: Dodge, 1938), 288 pp. $3.00.
Howard, R. E. "A Bill to Eliminate Dance Schools." *Amer. Dancer*. XI: (Apr. 1938), 9.

——— "National Dance Academy." *Amer. Dancer.* XI: (June 1938), 21.

Howe, E. C. "The Modern Dance and William Blake." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 6.

Huapala. "Children Love the Dances of Hawaii." *Amer. Dancer.* XI: (July 1938), 27.

Hungerford, M. J. "Grading Creative Dance." *Ed. Dance.* I: (Aug.-Sept. 1938), 3.

——— "A Problem in Dance Form." *Ed. Dance.* I: (Nov. 1938), 6.

——— "A Modern Dance." *Ed. Dance.* I: (June-July 1938), 6.

Jacques, H. "English Technique of Ballroom Dancing." *Amer. Dancer.* XI: (Jan. 1938), 27; (Feb. 1938), 27.

Jordan, D. *The Dance as Education.* (New York: Oxford University Press, 1938), 84 pp. $1.25.

Knox, F. F. "Dance—The Art Form of Physical Education." *Ed. Dance.* I: (Aug.-Sept. 1938), 8.

Lifar, S. *Ballet: Traditional and Modern.* (New York: Putnam, 1938), 302 pp. $4.00.

Loudl, E. "The ABC of Percussion." *Amer. Dancer.* XI: (Sept. 1938), 11.

Loxley, E. "The People Who Danced the Pavane." (Italy 1450–1550). *Ed. Dance.* I: (Aug.-Sept. 1938), 6.

——— "The Bourgeois Who Dances the Brante," (France 1550–1600). *Ed. Dance.* I: (Oct. 1938), 8.

——— "Catherine de Medici Dances the Courante," (1550–1600). *Ed. Dance.* I: (Nov. 1938), 8.

——— "Elizabeth and Her Gallants Danced the Galliard," (England 1550–1600). *Ed. Dance.* I: (Dec. 1938), 8.

MacEwan, C. "Rhythm Activities in High Schools." *Jr. Health & Phys. Ed.* IX: (Mar. 1938), 140.

Magriel, P. *A Bibliography of Dancing.* (New York: H. W. Wilson, 1936), 229 pp. $4.75.

Manakee, H. R. "Cadets Dance." *Amer. Dancer.* XI: (Aug. 1938), 14.

Martin, J. "The Dance—Pioneer American Art." *North Amer. Rev.* CCXLIV: (Winter 1937–8), 231.

Moore, L. *Artists of the Dance.* (New York: Crowell, 1938), 320 pp. $3.50.

Murphy, W. C. "Woodmere Plays." *Recreation.* XXXII: (Oct. 1938), 412.

Murray, A. *How to Become a Good Dancer.* (New York: Simon & Schuster, 1938), 212 pp. $1.96.

Orme, F. L. "Martha Graham Can Say 'No'." *Amer. Dancer.* XI: (Jan. 1938), 21.

——— "Ted Shawn." *Amer. Dancer.* XI: (Apr. 1938), 14.

——— "The Negro in the Dance." *Amer. Dancer.* XI: (Mar. 1938), 10.

Pease, E. E. "Social Dancing in Elementary Schools." *Ed. Dance.* I: (Nov. 1938), 10.

Peters, N. "The Ancestry of the Barn Dance." *Amer. Dancer.* XI: (July 1938), 17.

Pierre, D. B. "Dance Evolution." *Ed. Dance.* I: (Aug.-Sept. 1938), 10; (Oct. 1938), 10; (Nov. 1938), 11; (Dec. 1938), 11.

"Problems Related to Motor Ability. Musical Talent and Dancing Capacity. Rhythm and Dilemma Reaction Time. A Survey of the Literature on Rhythm." Res. Quar. IX: (Wellesley College Supplement, Mar. 1938), 57.

Powell, L. "Dancing and the Recreational Program." *Ed. Dance.* I: (Dec. 1938), 7.

Raffe, W. G. "Classic Ballet in the U.S.S.R." *Amer. Dancer.* XI: (Apr. 1938), 12.

"Revised Constitution and By-Laws, National Section on Dance." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 443.

Rudhyar, D. "Notes on Tension Release and Relaxation." *Ed. Dance.* I: (Oct. 1938), 4.

Shafer, M. S., and Mosher, M. M. *Rhythms for Children.* (New York: Barnes, 1938), 47 pp. $1.25.

Smith, P. C. "Pageants and Plays." *Am. Jr. Nursing.* XXXVIII: (Sept. 1938), 1012.

Starbuck, E. D. "The Mother Art." *Ed. Dance.* I: (May 1938), 3.

Stookey, M. M. "Dance Adventures Abroad." *Jr. Health & Phys. Ed.* IX: (Feb. 1938), 72.

Tolman, B. "The Country Dance Party." (Weston, Vt: Countryman Press, 1938), 16 pp. $0.25. (Pamphlet).

Van Alstyne, D., and Osborne, E. *Rhythmic Responses of Negro and White Children, Two to Six, with Special Focus on Regulated and Free Rhythm Situations.* (Washington, D.C.: National Research Council, Society for Research in Child Development, I, No. 4, Serial No. II).

Ware, W. "Ballet Comes of Age." *Amer. Dancer.* XI: (Apr. 1938), 13.

——— "In Defence of the Male Dancer." *Amer. Dancer.* XI: (May 1938), 15.

Zook, M. "Modern Dance for Modern Children." *Ed. Dance.* I: (Oct. 1938), 3.

DIAGNOSIS, EXAMINATION, INSPECTION, ETC.

Barton, J. W. *How Is Your Blood Pressure?* (New York: Bell Lib., 1938), (pamphlet) $0.10.

Binning, G. "Adequate School Examination." *Can. Public Health Jr.* XXIX: (Jan. 1938), 13.

Boynton, R. E. "The Routine Wassermann Test in College Students." *Journal-Lancet.* LVIII: (Mar. 1938), 134.

Burns, E. M. "Psychologic Factors in Physical Disease." *Northwest Medicine.* XXXVII: (Jan. 1938), 1.

Cameron, W. J. "A Study of Early Adolescent Personality." *Progress. Education.* XV: (Nov. 1938), 553.

Campbell, M. "The Experimental Analysis of General Motor Ability." *Jr. Gen. Psych.* XIX: (Oct. 1938), 401.

Clark, W. T., and Sargent, C. A. "Investigation of Early Syphilis." *Am. Jr. Public Health.* XXVIII: (July 1938), 807.

Clendening, L. *Workbook in Elementary Diagnosis for Teaching Clinical History Recording and Physical Diagnosis.* (St. Louis: Mosby, 1938), 167 pp. $1.50.

Davis, M. M. "Facts and Issues Regarding Public Medical Care." *New Eng. Jr. Med.* CCXVIII: (Jan. 27, 1938), 143.

Dayton, N. A. "What Massachusetts Does for its Mental Defectives." *New Eng. Jr. Med.* CCXVIII: (Jan. 6, 1938), 13.

Frost, L. H. "Individual Structural Differences in the Orthopedic Examination." *Jr. Health & Phys. Ed.* IX: (Feb. 1938), 90.

Gardiner-Hill, H. "Abnormalities of Growth and Development: The Clinical and Pathological Aspects." *Brit. Med. Jr.* I: (June 19, 1937), 1241; (June 26, 1937), 1302.

Harper, E. O., and Palmer, H. D. "College Mental Hygiene Methods." *Journal-Lancet.* LVIII: (May 1938), 250.

Harris, I. *Diet and High Blood Pressure.* (New York: Longmans, Green, 1937), 196 pp. $3.50.

Hedley, O. F. "Incidence of Rheumatic Heart Disease in College Students." *Pub. Health Rep.* LIII: (Sept. 16, 1938), 1635.

Lewis, W. H. Jr. "Changes with Age in the Basal Metabolic Rate in Adult Men." *Am. Jr. Physiol.* CXXI: (Feb. 1938), 502.

——— "Changes with Age in the Cardiac Output in Adult Men." *Am. Jr. Physiol.* CXXI: (Feb. 1938), 517.

——— "Changes with Age in the Blood Pressure in Adult Men." *Am. Jr. Physiol.* CXXII: (May 1938), 491.

Lyght, C. E. "A Tuberculosis Case-Finding Program for the Smaller College." *Journal-Lancet.* LVIII: (Apr. 1938), 180.

Maresh, M. M., and Washburn, A. H. "Size of the Heart in Healthy Children; Roentgen Measurements of the Cardiac Area and Transverse Diameter for Sixty-seven Children between Birth and the Age of Six Years." *Am. Jr. Dis. Child.* LVI: (July 1938), 33.

Meredith, H. V. "Bodily Changes in Adolescence." *Hygeia.* XVI: (Sept. 1938), 832; (Oct. 1938), 927.

Myers, J. A. "The Importance of Early Discovery of Tuberculosis among College Students." *Bul. Ass'n Am. Colls.* XXIV: (May 1938), 264.

——— Boynton, R. E., and Streukens, T. L. "After Diagnosis, What Next?" *Journal-Lancet.* LVIII: (June 1938), 283; *Proc. Am. Student Health Ass'n.* (1937), 49.

Newer Diagnostic Methods. (Nutrition). (New York: Millbank Memorial Fund, 1938), 192 pp. $1.00.

Palmer, C. E. "The Dark Adaptation Test for Vitamin A Deficiency." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 309.

Poffenberger, A. T. "Some Unsolved Problems in Human Adjustment." *Science.* LXXXVII: (Feb. 11, 1938), 124.

Poindexter, H. A. "Handicaps in the Normal Growth and Development of Rural Negro Children." *Amer. Jr. Pub. Health.* XXVIII: (Sept. 1938), 1048.

Schwartz, L. "Diagnosis of Industrial Skin Diseases." *Am. Jr. Pub. Health.* XXVIII: (May 1938), 593.

Sellers, A. H. "The Physician's Statement of Cause of Death." *Am. Jr. Pub. Health.* XXVIII: (Apr. 1938), 430.

Slesinger, H. A. "Heart Murmurs." *Hygeia.* XVI: (Mar. 1938), 206.

Stine, D. G. "The Meaning of 'Athletic Heart' Among University Athletes." *Journal-Lancet.* LVIII: (Sept. 1938), 405; *Proc. Am. Student Health Ass'n.* (1937), 26.

Sutherland, J. P. *Malnutrition, the Medical Octopus.* (Boston: Meador Publishing Co., 1937), 368 pp. $3.00.

Talbot, F. B. "Measurement of Obesity by the Creatine Coefficient." *Am. Jr. Dis. Child.* LV: (Jan. 1938), 42.

Talbot, H. P. "Results of Premarital Blood Tests—1936 and 1937." *Conn. Mo. Health Bull.* LII: (Feb. 1938), 39.

Taylor, R. E. "The Use of the Fluoroscope in Examination of College Students." *Journal-Lancet.* LVIII: (July 1938), 333; *Proc. Am. Student Health Ass'n.* (1937), 57.

Weisman, S. A. *Your Chest Should be Flat.* (Philadelphia: Lippincott, 1938), 145 pp. $2.00.

Woodbury, R. A., Robinow, M., and Hamilton, W. F. "Blood Pressure Studies on Infants." *Am. Jr. Physiol.* CXXII: (May 1938), 472.

Zachry, C. B. "Some General Characteristics of Adolescence." Progress. Ed. XV: (Dec. 1938), 591.

DISEASE

Amberson, J. B., Jr. "The Significance of Latent Forms of Tuberculosis." *New Eng. Jr. Med.* CCXIX: (Oct. 13, 1938), 572.

Ash, R. "Influence of Tonsillectomy on Rheumatic Infection." *Am. Jr. Dis. Child.* LV: (Jan. 1938), 63.

Boas, E. P. "How Restricted is the Life of a Patient with Heart Disease?" *Hygeia.* XVI: (Sept. 1938), 800.

Cameron, J. J. "Control of Communicable Disease: A Federal Responsibility." *Can. Public Health Jr.* XXIX: (Sept. 1938), 445.

"Cancer." *The Commonwealth.* (Mass. Dept. Public Health). XXV: (July-Aug.-Sept. 1938), 191.

Crook, B. L. "Outwitting Arthritis." *Hygeia.* XVI: (Feb. 1938), 106.

Dauer, C. C. "Sex Differences in Trends of Tuberculosis Mortality." *Am. Jr. Hyg.* XXVII: (May 1938), 538.

Donnison, C. P. *Civilization and Disease.* (Baltimore: Wood, 1938), 222 pp. $3.00.

Elkind, H. B. "Is There an Epidemiology of Mental Disease?" *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 245.

Emerson, K. "Student Cooperation in Tuberculosis Control." *Journal-Lancet.* LVIII: (Nov. 1938), 476.

Eskey, C. R. "Fleas as Vectors of Plague." *Amer. Jr. Pub. Health.* XXVIII: (Nov. 1938), 1305.

——— "Recent Developments in Our Knowledge of Plague Transmission." *Pub. Health Rep.* LIII: (Jan. 14, 1938), 49.

Ewing, J. "The Public and the Cancer Problem." *Science.* LXXXVII: (May 6, 1938), 399.

Fenton, G. S. "The Simplicity of the Treatment of Tuberculosis." *Can. Pub. Health Jr.* XXIX: (Mar. 1938), 109.

Ferguson, R. G. "Some Fundamentals in Tuberculosis Prevention." *Can. Pub. Health Jr.* XXIX: (May 1938), 203.

Fishbein, J. N. "Oh, It's Just a Cold." *Hygeia.* XVI: (Nov. 1938), 988.

Fredericks, L. H. "The Treatment of Pernicious Anemia." *Journal-Lancet.* LVIII: (Feb. 1938), 54.

Frost, W. H. "The Familial Aggrega-

tion of Infectious Diseases." *Am. Jr. Pub. Health.* XXVIII: (Jan. 1938), 7

Gilroy, F. "I've Got the Gout!" *Forum.* C: (Oct. 1938), 153.

Green, R.G., and Larson, C. L. "Shock Disease and the Snowshoe Hare Cycle." *Science.* LXXXVII: (Apr. 1, 1938), 298.

Hardy, A. V., and Watt, J. "The Acute Diarrheal Disorders." *Am. Jr. Pub. Health.* XXVIII: (June 1938), 730.

Hawes, J. B., II, and Stone, M. J. "Progress in Tuberculosis 1936–1937. *New Eng. Jr. Med.* CCXVIII: (Mar. 17, 1938), 479.

Hilleboe, H. E. "The Needs of the Tuberculous." *Journal-Lancet.* LVIII: (Oct. 1938), 440.

——— "Preventive Aspects of Crippling Diseases." *Am. Jr. Pub. Health.* XXVIII: (Apr. 1938), 451.

"I'm Not Afraid of Cancer!" *Hygeia.* XVI: (Feb. 1938), 139.

Jennings, F. L. "Tuberculosis Among Older Age Groups." *Journal-Lancet.* LVIII: (Apr. 1938), 160.

Jones, I. W. "Acne—the Plague of Youth." *Hygeia.* XVI: (Oct. 1938), 881.

Jones, T. D. "Heart Disease in Childhood." *Am. Jr. Pub. Health.* XXVIII: (May 1938), 637.

Kelly, F. C. "Your Rheumatism." *Forum.* XCIX: (Apr. 1938), 202.

Koehler, P. B. "Rheumatic Heart Disease." *Hygeia.* XVI: (June 1938), 503.

Lombard, H. L. "Studies on the Familial Aspects of Cancer." *New Eng. Jr. Med.* CCXVIII: (Apr. 28, 1938), 711.

Lord, F. T. "The Prevention and Control of Tuberculosis in Massachusetts." *New Eng. Jr. Med.* CCXIX: (Aug. 4, 1938), 163.

Master, A. M. "Optimism in Heart Disease." *Hygeia.* XVI: (July 1938), 594.

McLeod, J. K. "Communicable Diseases, Past, Present and Future." *Can. Pub. Health Jr.* XXIX: (Sept. 1938), 443.

Myers, J. A. *Tuberculosis Among Children and Young Adults.* (Baltimore: C. C. Thomas, 1938), 401 pp. $4.50.

Parran, T. "Syphilis: A Public Health Problem." *Science.* LXXXVII: (Feb. 18, 1938), 147.

Perkins, W. H. *Cause and Prevention of Disease.* (Philadelphia: Lea & Febiger, 1938), 713 pp. $7.50.

Potter, B. P. "Tuberculosis Up to Date: I, II, III." *Hygeia.* XVI: (Apr. 1938), 300; (May 1938), 408; (June 1938), 515; (July 1938), 614; (Aug. 1938), 733; (Sept. 1938), 796; (Oct. 1938), 920; (Nov. 1938), 1014.

Price, R. M. "Bovine Tuberculosis in Children." *Can. Pub. Health Jr.* XXIX: (June 1938), 251.

Scheifley, C. H. "The Prevalence of Trichinosis." *Am. Jr. Hygiene.* XXVII: (Jan. 1938), 142.

Skinner, G. A. "Parasite Tricks." *Hygeia.* XVI: (Mar. 1938), 231; (Apr. 1938), 348; (May 1938), 414; (June 1938), 528; (July 1938), 611; (Aug. 1938), 730; (Sept. 1938), 821; (Oct. 1938), 904; (Nov. 1938), 1016; (Dec. 1938), 1123.

Smith, C. A. "Dangers of Tuberculosis in Childhood." *New Eng. Jr. Med.* CCXIX: (Aug. 25, 1938), 260.

"Summary of Current Prevalence of Communicable Diseases," *Pub. Health Rep.* LIII: (Apr. 15, 1938), 551.

Ullmann, E. V. *Diet in Sinus Infections and Colds.* (New York: Macmillan, 1937), 166 pp. $2.00.

Underwood, E. A. *A Manual of Tuberculosis: For Nurses and Public Health Workers.* (Baltimore: Wood, 1938), 404 pp. $3.25.

Waring, J. I. "Nutritional Heart Disease in Children." *Am. Jr. Dis. Child.* LV: (Apr. 1938), 750.

Wormley, L. C. "The Common Cold." *Hygeia.* XVI: (Jan. 1938), 15.

Zimmerman, L. M. "Closing in on Cancer." *Hygeia.* XVI: (Aug. 1938), 714.

DRUGS, ALCOHOL, NARCOTICS, POISONS, TOBACCO

Allen, E. B. "Alcoholism as a Psychiatric Medical Problem." *N. Y. State Jr. Med.* XXXVIII: (Dec. 1, 1938), 1492.

Comstock, B. J. W., and Baker, A. L. *Plain Facts for Girls and Young Women on Narcotics, Liquor and Tobacco.* (Mountain View, Calif.: Pa-

cific Press, 1938), 96 pp. $0.35 pa.

Durfee, C. H. *To Drink or Not to Drink?* (New York: Longman, 1938), 212 pp. $2.00.

Grabfield, G. P. "The Relation of Newer Drugs to Public Health." *New Eng. Jr. Med.* CCXVIII: (June 2, 1938), 911.

Leary, T. "Some Newer Aspects of the Alcohol Problem." *New Eng. Jr. Med.* CCXVIII: (May 19, 1938), 827.

Lester, M. "Drugging China." *Living Age.* CCCLIV: (July 1938), 405.

Macy, F. S., and Silkworth, W. D. "The Value of Iodine and Gold in the Treatment of Alcoholism." *Journal-Lancet.* LVIII: (June 1938), 291.

Marihuana More Dangerous than Heroin or Cocaine." *Sci. Am.* CLVIII: (May 1938), 293.

Merrill, F. T. "Dangerous Marihuana." *Am. Jr. Nursing.* XXXVIII: (Aug. 1938), 872.

——— *Marihuana. The New Dangerous Drug.* (Washington, D. C. Foreign Policy Ass'n, Inc., 1938), 48 pp. $0.15.

Montgomery, F. A., Jr. "Know Your Poison Plants." *Field & Stream.* XLIII: (June 1938), 80.

Morell, P. *Poisons, Potions and Profits.* (New York: Knight, 1937), 292 pp. $2.00.

Newman, H. W., and Lehman, A. J. "Nature of Acquired Tolerance to Alcohol." *Jr. Pharm. & Exp. Therap.* LXII: (Mar. 1938), 301.

Parkhurst, G. "Drinking & Alcoholism." *Harper's.* CLXXVI: (July 1938), 158.

Pearl, R. "Tobacco Smoking and Longevity." *Science.* LXXXVII: (Mar. 4, 1938), 216.

Reed, M. L. *Physiological and Psychological Effects of Alcohol and Their Social Consequences.* (New York: Lakeside Pub. Co., 1937), 46 pp. $0.15.

"Research Council on Problems of Alcohol." *Science.* LXXXVIII: (Oct. 7, 1938), 329.

Schweitzer, A., and Wright, S. "Action of Nicotine on the Spinal Cord." *Jr. Physiol.* XCIV: (Oct. 14, 1938), 136.

Scott, C. C. and W. W., and Luckhardt, A. B. "The Effect of Alcohol on the Hunger Sense." *Am. Jr. Physiol.* CXXIII: (July 1938), 248.

"Smoking and Its Effect Upon Visual Accommodation." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 30.

Strecker, E. A. "Psychology Cures Alcoholism." *Forum.* C: (Aug. 1938), 82.

Strecker, E. A. and Chambers, F. T. *Alcohol: One Man's Meat.* (New York: Macmillan, 1938), 230 pp. $2.50.

Thomason, G., and Baker, A. L. *Science Speaks to Young Men on Liquor, Tobacco, Narcotics, and Marihuana.* (Mountain View, Calif.: Pacific Press, 1938). $0.35.

Waddell, J. A., and Haag, H. B. *Alcohol in Moderation and Excess.* (Richmond, Va.: Byrd Press, 1938), 184 pp. $1.00.

Walton, R. P. Marihuana: America's New Drug Problem. (Philadelphia: Lippincott, 1938), 223 pp. $3.00.

Weeks, C. C. *Alcohol and Human Life.* (London: Lewis, 1938), 454 pp. 6s.

Williams, H. S. *Drug Addicts are Human Beings: The Story of Our Billion-Dollar Drug Racket—How We Created It and How We Can Wipe It Out.* (Washington, D.C.: Shaw Pub. Co., 1938), 273 pp. $2.50.

EUGENICS, EVOLUTION, GENETICS, HEREDITY

Bradley, J. H. *Patterns of Survival: An Anatomy of Life.* (New York: Macmillan, 1938), 223 pp. $2.25.

Cohen, J. "Determinants of Physique." *Jr. Men. Sci.* LXXXIV: (1938), 495.

Frank, L. K. "Eugenics and Education." *Ment. Hyg.* XXII: (Jan. 1938), 72.

Goldschmidt, R. *Physiological Genetics.* (New York: McGraw-Hill, 1938), 375 pp. $4.00.

Linton, R. "The Present Status of Anthropology." *Science.* LXXXVII: (Mar. 18, 1938), 241.

Newman, B. M. "Can Man Create Life?" *Sci. Am.* CLVIII: (Apr. 1938), 219.

——— "Giant Molecules: The Machinery of Inheritance." *Sci. Am.* CLVIII: (June 1938), 336.

Popenoe, P. "Sterilization in Practice." *Survey Midmonthly*. LXXIV: (June 1938), 202.

Rourke, E. L. "Life's Perpetual Children." *Hygeia*. XVI: (June 1938), 512.

Sturtevant, A. H. "Essays on Evolution. III. On the Origin of Interspecific Sterility." *Quar. Rev. Biology*. XIII: (Sept. 1938), 333.

Thorndike, E. L. "Heredity and Environment." *Jr. Ed. Psychol.* XXIX: (Mar. 1938), 161.

Whitaker, W. L. "The Question of a Seasonal Sterility Among the Eskimos." *Science*. LXXXVIII: (Sept. 2, 1938), 214.

FIRST AID, ACCIDENTS, EMERGENCIES, NURSING

Accident Facts. (Chicago: National Safety Council, 1938), 97 pp. $0.50.

Biederman, J. B. "Observations on the Relation of Poison Ivy and Poison Oak." *New Eng. Jr. Med.* CCXIX: (Jul. 28, 1938), 117.

Blanchard, V. S. "A Study of First-Aid Procedures Followed by Certain Secondary Schools in Detroit and Michigan." RES. QUAR. IX: (Mar. 1938), 77.

Eliason, E. L. *First Aid in Emergencies*. (Rev. ed., (Philadelphia: Lippincott, 1938), 240 pp. $1.75.

Elsom, J. C. "Charley-Horse." *Hygeia*. XVI: (Nov. 1938), 983.

Ferris, E. B., Blankenhorn, M. A., Robinson, H. W., and Cullen, G. E. "Heat Stroke: Clinical and Chemical Observations on 44 Cases." *Jr. Clin. Invest.* XVII: (1938), 249.

Frederick, H. K., and Northam, E. *A Textbook of Nursing Practice*. (New York: Macmillan, 1938), 418 pp. $3.00.

Gildersleeve, G. N. "First Aid Treament of Fractures." *Am. Jr. Nursing*. XXXVIII: (June 1938), 627.

Hall, L. M. "Infections." *Hygeia*. XVI: (Mar. 1938), 225.

Henderson, Y. *Adventures in Respiration: Modes of Asphyxiation and Methods of Resuscitation*. (Baltimore: Wood, 1938), 316 pp. $3.00.

Johnson, A. S. "First Aid on the Trail." *Hygeia*. XVI: (July 1938), 617.

Knapp, V. *Principles and Practice of Medical Nursing*. (New York: Putnam's Sons, 1938), 366 pp. $3.00.

Learned, R. A. "No More Accidents." *Hygeia*. XVI: (July 1938), 623.

Pearce, E. C. *A General Textbook of Nursing*. (New York: Dutton, 1938), 888 pp. $3.75.

Porter, L., and Carter, W. E. *Management of the Sick Infant and Child*. (5th ed.; St. Louis: Mosby, 1938), 874 pp. $10.00.

Stack, H. J. "Accidents and the National Health." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 142; *Health Officer*. III: (Nov. 1938), 191.

"Strapping and Bandaging." *Ath. Jr.* XIX: (Sept. 1938), 16.

Swanson, M. "Functions of the School Nurse." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 416.

——— "Functions of the Nurse—a Problem in School Health Administration." *Proc. Nat'l Ed. Ass'n*, (1938), 170.

Thorndike, A., Jr. *Athletic Injuries: Prevention, Diagnosis and Treatment*. (Philadelphia: Lea & Febiger, 1938), 208 pp. $3.00.

——— "Trauma Incident to Sports and Recreation." *New Eng. Jr. Med.* CCXIX: (Sept. 29, 1938), 457.

Tracy, M. A. *Nursing: An Art and Science*. (St. Louis: Mosby, 1938), 559 pp. $3.00.

Traub, E. F. "Burns." *Hygeia*. XVI: (Dec. 1938), 1064.

Vincent, E. L. *Mental Hygiene for Nurses*. (Philadelphia: Saunders, 1938), 263 pp. $2.00.

Wiechec, F. J. "Adhesive Plaster." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 500.

FOOD, DIET, NUTRITION

Adolph, W. H. "Vegetarian China." *Sci. Am.* CLIX: (Sept. 1938), 133.

Behm, D. F. "Stopping Food Leaks." *Nation's Schools*. XXI: (Feb. 1938), 60.

Belfrage, S. H. *Facts about Food*. (New York: Oxford Univ. Press, 1938), 177 pp. $1.50.

Best, C. H., and Ridout, J. H. "Undernutrition and Liver Fat." *Jr. Physiol.* XCIV: (Oct. 1938), 47.

Bowes, A. D., and Church, C. F. *Food Values of Portions Commonly Served.* (Philadelphia: Dolbey, 1937), 12 pp. $0.50.

Buckstein, J. *Eat and Keep Fit.* (New York: Emerson Books, Inc., 1938), 128 pp. $1.00.

Burnett, F. L. "Progress in Nutrition." *New Eng. Jr. Med.* CCXIX: (Oct. 6, 1938), 524.

Callow, A. B. *Food and Health.* (New York: Oxford Univ. Press, 1938), 168 pp. $1.50.

Campbell, A. S. "Is Your Milk Safe?" *Forum.* C: (Oct. 1938), 183.

Chambers, W. H. "Undernutrition and Carbohydrate Metabolism." *Physiol. Rev.'s.* XVIII: (Apr. 1938), 248.

Covey, C. C. "Control in Campus Feeding." *Nation's Schools.* XXI: (Mar. 1938), 55.

Dean, S. W. "*That* Was Cooking!" *Forum.* C: (Nov. 1938), 265.

Derryberry, M. "Reliability of Medical Judgments on Malnutrition." *Pub. Health Rep.* LIII: (Feb. 18, 1938), 263.

"Diet of British School Children." *Sch. & Soc'y.* XLVII: (Feb. 5, 1938), 174.

East, B. R. "Nutrition and Dental Caries." *Am. Jr. Pub. Health.* XXVIII: (Jan. 1938), 72.

Ellinger, C. "Controlling Contamination of Raw Milk. *Can. Pub. Health Jr.* XXIX: (June 1938), 277.

"Food, Drug, and Cosmetic Act." *Sci. Am.* CLIX: (Nov. 1938), 257.

Ford, F. M. "Food: The World on a Flabby Diet." *Forum.* XCIX: (Apr. 1938), 241.

Grantham, A. B. "Prelude to Eating." *Nation's Schools.* XXI: (Jan. 1938), 59.

Graves, L. A. "Food Fallacies." *Parent's Mag.* XII: (Nov. 1937), 32.

Gregory, A. L. "The Story of Food." *Jr. Health & Phys. Ed.* IX: (Mar. 1938), 131.

Gregory, J. *ABC of the Vitamins: A Survey in Charts.* (Baltimore: Wood, 1938), 93 pp. $3.00.

Halsted, S. S. "The Nutritionist in a City Public Health Program." *Am. Jr. Pub. Health.* XXVIII: (July 1938), 849.

Harris, L. J. *Vitamins in Theory and Practice.* (New York: Macmillan, 1937), 242 pp. $3.00.

Holmes, H. N. *Have You Had Your Vitamins?* (New York: Farrar & Rinehart, 1938), 60 pp. $1.00.

Irving, J. T., and Richards, M. B. "Early Lesions of Vitamin A Deficiency." *Jr. Physiol.* XCIV: (Dec. 1938), 307.

Jacobs, M. B. *Chemical Analysis of Foods and Food Products.* (New York: Macmillan, 1938), 537 pp. $6.00.

Janeway, E. "A Fair Price for Milk." *Forum.* XCIX: (Feb. 1938), 72.

Krasnow, F. "Nutritional Influence on Teeth." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 325.

Lichterman, A. "Supervision of Food in New York City." *Am. Jr. Pub. Health.* XXVIII: (July 1938), 845.

Macdonald, G. *Food Facts and Diet Planning.* (New York: Macmillan, 1938), 168 pp. $1.00.

Martin, E. A. "Body Building and Regulating Foods." *Hygeia.* XVI: (Feb. 1938), 165; (Mar. 1938), 256; (May 1938), 454; (June 1938), 552.

McCollum, E. V. "Present Status of Vitamin Milks. *Am. Jr. Pub. Health.* XXVIII: (Sept. 1938), 1069.

McDougall, F. L. *Food and Welfare.* (New York: Columbia Univ. Press, 1938), 56 pp. $0.40.

McHenry, E. W. "The Nutritional Value of Raw and Pasteurized Milk." *Can. Pub. Health Jr.* XXIX: (June 1938), 295.

Miller, L. M. "The Vitamin Follies." *Hygeia.* XVI: (Nov. 1938), 1004.

Morris, W. E. "Nutrition Program in a State Health Department." *Am. Jr. Pub. Health.* XXVIII: (June 1938), 718.

Neprud, R. E. "Milk—from Dairy to Dinner." *Hygeia.* XVI: (July 1938), 608.

"Nutritional Aspects of Milk Pasteurization." *Can. Pub. Health Jr.* XXIX: (June 1938), 276.

Palmer, L. S. "The Fundamentals of

Nutrition." *Journal-Lancet*. LVIII: (May 1938), 219.

Peterson, A. B. "Food Habits of Sixth and Seventh Grade Pupils in the Elementary Schools of Chicago." RES. QUAR. IX: (Dec. 1938), 75.

Paull, L. E. "Effect of Improvement in Nutrition on Mental Capacity of Young Children." *Child Dev'p't*. IX: (Mar. 1938), 123.

Poulton, E. P. "Heat Production, Nutrition, and Growth in Man: Some New Views." *Nature*. CXLI: (Jan. 22, 1938), 145; (Jan. 29, 1938), 187.

Rabinowitch, I. M. "Calories and Occupation." *Can. Med. Ass'n Jr.* XXXVIII: (Mar. 1938), 277.

Roberts, B. E. "Nutritional Education in the Home—Dutchess County, N.Y. Project." *Am. Jr. Pub. Health*. XXVIII: (Aug. 1938). 944.

Rose, M. S. *The Foundations of Nutrition*. (3rd ed.; New York: Macmillan, 1938), 625 pp. $3.50.

Rose, W. C. "The Nutritive Significance of the Amino Acids." *Physiol. Rev's*. XVIII: (Jan. 1938), 109.

Simmonds, N. "Present Status of Dental Caries in Relation to Nutrition." *Am. Jr. Pub. Health*. XXVIII: (Dec. 1938), 1381.

Stewart, J. J. *Foods: Production, Marketing, Consumption*. (New York: Prentice-Hall, 1938), 737 pp. $3.25.

Stone, H. "The Functions of the Nutritionist." *Jr. Health & Phys. Ed*. IX: (Oct. 1938), 482.

——— "Functions of the Nutritionist in School Health Administration." *Proc. Nat'l Ed. Ass'n*. (1938), 170.

Szekely, E. *Therapeutics of Fasting*. (London: Daniel, 1938), 24 pp. $0.25.

Tischer, A. O. "The Nature of Vitamin A in Cod Liver Oil." *Jr. Biol. Chem*. CXXV: (Oct. 1938), 475.

Wilder, R. M. "Food Facts and Fallacies." *Hygeia*. XVI: (July 1938), 628.

Wolberg, L. R. "The Hay Food Fantasy." *Hygeia*. XVI: (Apr. 1938), 311.

——— *The Psychology of Eating*. (New York: McBride, 1937), 321 pp. $3.00.

HEALTH EDUCATION, SAFETY, TRAINING, ETC.

Bailey, E. W. "The Administrator and Health Education." *Jr. Health & Phys. Ed*. IX: (June 1938), 344.

——— "The Division of Health Education." *Jr. Health & Phys. Ed*. IX: (Feb. 1938), 67.

Bauer, W. W. "The Doctor in Health Education." *Journal-Lancet*. LVIII: (Sept. 1938), 393.

Beard, J. H. "Health Teaching in High Schools." *Sch. & Soc'y*. XLVII: (Apr. 23, 1938), 545.

Bradshaw, R. W. (Chm.) "Report of the Eye Health Committee of the American Student Health Association." *Journal-Lancet*. LVIII: (Dec. 1938), 525.

——— "The Scope of Student Health Service." *Journal-Lancet*. LVIII: (Feb. 1938), 96.

Broden, R. "A Health Skit." *Jr. Health & Phys. Ed*. IX: (Mar. 1938), 176.

Connolly, M. P. "What Every Health Officer Should Know." *Am. Jr. Pub. Health*. XXVIII: (Sept. 1938), 1083.

Connor, W. L., Hawkins, G. C., and McCarty, K. A. "The Cleveland Experiment in the Development of Health, Character, and School Citizenship." *Jr. Ed. Research*. XXXIII: (Sept. 1938), 23.

Conrad, H. L., and Meister, J. K. *Teaching Procedures in Health Education*. (Philadelphia: Saunders, 1938), 160 pp. $1.75.

Davis, L. B. "The Function of the Health Teacher." *Jr. Health & Phys. Ed*. IX: (Sept. 1938), 420; *Proc. N. E. A*. (1938), 169.

Donohue, F. J., and Reaume, W. J. "Health Education in Detroit." *Sch. & Soc'y*. XLVIII: (Nov. 12, 1938), 632.

Drenckhahn, V., and Grout, R. E. "Health Materials for Rural Schools." *Jr. Health & Phys. Ed*. IX: (Mar. 1938), 152.

Easlick, K. A. "Dental Health Education—Can School Children Get It?" *Jr. Sch. Hyg*. VIII: (Mar. 1938), 68.

Everts, E. W. "Health and Physical Education" (Research Review, 1934–7). *Rev. Ed. Res*. VIII: (Feb. 1938), 39.

Guernsey, P. D. "Experiments in Health Education at the College Level." RES. QUAR. IX: (May 1938), 30.

Hughes, W. L., and Stimson, P. E. "Motion Pictures in Health and Physical Education." RES. QUAR. IX: (Mar. 1938), 104.

Hussey, M. M. *Teaching for Health.* (New York: Univ. Book Store, 1938), 312 pp. $2.75.

Hutchinson, M. G. "Professional Training in Health Education." RES. QUAR. IX: (Oct. 1938), 37.

Jastrow, J. "The Story of Human Energies: I, II." *Hygeia.* XVI: (Feb. 1938), 141, (Mar. 1938), 238.

Latimer, J. V. "Use of the Growth Motive in Teaching Health." *Hygeia.* XVI: (Oct. 1938), 949.

McVicar, J. W. "Health is your Greatest Wealth." *Jr. Health & Phys. Ed.* IX: (Feb. 1938), 85.

Nathan, W. B. "Health Education Among Negroes." *Jr. Ed. Sociol.* XI: (May 1938), 532.

O'Neill, F. C. "Curriculum Building in Health Education." *Jr. Health and Phys. Ed.* IX: (Apr. 1938), 212.

Parran, T. "Educating the Nation Toward Health." *Sch. Life.* XXIII: (Jan. 1938), 129.

Phair, J. T. "An Experiment in Health Teaching in Ontario." *Jr. Sch. Health.* VIII: (Mar. 1938), 73.

Rogers, J. F. "Health Education and Health Services in Schools." *Jr. A.M.A.* CIX: (Sept. 11, 1937), 842.

——— "Health and Physical Education in the Changing Curriculum." *Sch. & Soc'y.* XLVIII: (Sept. 17, 1938), 370.

——— *Safety and Health of the School Child: a Self-Survey of School Conditions and Activities.* (Washington: U.S. Office of Education., Pam. No. 75), 29 pp. $0.10.

Schwitalla, A. M. "Student Health Service in the University." *Journal-Lancet.* LVIII: (Mar. 1938), 139.

Smith, H. N. "Trends in Health and Physical Education." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 20.

Steinhaus, A. H. *A Manual of Sources and Suggestions for Health Education; and Supplement.* (Chicago: Author, 5315 Drexel Ave., 1938), $1.00; suppl., $0.25.

Turner, C. E. and Riley, P. L. "The Training of the Health Educator." *Jr. Health & Phys. Ed.* IX (Jan. 1938), 13.

"Using Health Knowledge." *Hygeia,* XVI: (June 1938), 555.

Westaby, R. S. "Preventive School Health Service." *Am. Sch. Bd. Jr.* XCVII: (Oct. 1938), 51.

Wood, T. D. "Health, the Teacher's 'Pearl of Great Price.'" *Sch. & Soc'y.* XLVII: (May 14, 1938), 635.

York, W. H. "Does Our Physical Activity Program Function as Health Education?" *Journal-Lancet.* LVIII: (June 1938), 292; *Proc. Am. Student Health Ass'n.* (1937), 26.

Safety

Bowman, E. C., and Boston, P. F. *Living Safely.* (New York: Macmillan, 1938), 177 pp. $0.52.

Bryce, C. *The Safe-Way Club.* (New York: Thos. Nelson & Sons, 1938), 107 pp. $1.50.

Carr, W. G., *et al.* "Safety Education Through Schools." *Res. Bull. Nat'l Ed. Ass'n.* XVI: (Nov. 1938), 59 pp.

Davidson, M. G. *Bibliography: Safety Education.* (E. Syracuse, N.Y.: The Compiler, 1938), 28 pp. $0.50. (Mimeo.)

DeSilva, H. R. "Applications of Driver Clinics." *Jr. Psychol.* VI: (1938), 233.

——— and Channell, R. "Driver Clinics in the Field." *Jr. App. Psychol.* XXII: (Feb. 1938), 59.

Dull, C. E. *Safety First—and Last.* (New York: Holt, 1938), 241 pp. $1.75.

Godfrey, C. V. *Road Sense for Children.* (New York: Oxford, 1938), 78 pp. $0.25.

Holbrook, S. H. *Let Them Live.* (New York: Macmillan, 1938). 178 pp. $1.50.

Knight, A. W. "Safety First." *Hygeia.* XVI: (Jan. 1938), 11.

Lauer, A. R. "Checking Up on the Driver." *Amer. City.* LIII: (Jan. 1938), 52.

Morse, G. D. "Driver Training for High Schools Pupils *Sch. & Soc'y.* XLVIII: (Nov. 19, 1938), 654.

Myers, H. *Promotion of Safety on the*

Highways. (Lafayette, Ind.: Purdue Univ., 1938), 23 pp. (gratis).

Noffsinger, F. R. *State Rules and Regulations Governing Safety Education in the United States*. (Washington: American Automobile Ass'n., 1938), 30 pp.

Parker, A. E. "On the Altar of Speed." *Hygeia*. XVI: (Dec. 1938), 1088.

"Safety Education Program in the High Schools of New York State." *Sch. & Soc'y*. XLVII: (Mar. 19, 1938), 365.

Safety Education through Schools. Res. Bull. Nat'l. Ed. Ass'n. XVI: (Nov. 1938), 60 pp. $0.25.

Sportsmanlike Driving. (Washington: American Automobile Ass'n., 1938), 502 pp. $2.50; $1.10 to A.A.A. clubs and schools.

Sullivan, J. P. "Present Status of Safety Education in Some Representative School Systems." *Am. Jr. Pub. Health*. XXVIII: (Oct. 1938), 1175.

Wooldridge, C. L. "Let's Play Safe!" *Nation's Sch*. XXI: (Apr. 1938), 52.

HEALTH INSURANCE

Falk, I. S. "Health Insurance: at Home and Abroad." *Am. Jr. Nursing*. XXXVIII: (May 1938), 519.

Francis, B. H., and Harwood, S. *Accident and Health Insurance from the Victim's Point of View*. (Cambridge, Mass.: Amer. Institute for Econ. Res., 1938), 66 pp. $1.00.

Jerneman, T. "Social Insurance in Sweden." *Annals of Am. Academy*. CXCVII: (May 1938), 80.

Joyner, S. C. "Buying School Insurance." *Am. Sch. Board Jr*. XCVI: (Mar. 1938), 51.

Millis, H. A. *Sickness and Insurance*. (Chicago: Univ. Chicago Press, 1937), 166 pp. $2.00.

Orr, D. W., and J. W. *Health Insurance with Medical Care*. (New York: Macmillan, 1938), 271 pp. $2.50.

Reed, L. S. *Health Insurance: The Next Step in Social Security*. (New York: Harper & Bros., 1937), 281 pp. $5.00.

"Sickness Insurance in Norway." *U. S. Monthly Labor Rev*. XLVI: (May 1938), 1122.

Wagner, R. F. "Investigation of Security Against Sickness." *Am. Labor Leg. Rev*. XXVIII: (June 1938), 77.

HEATING, LIGHTING, VENTILATING

Darley, W. G. "Lighting—First or Last?" *Am. Sch. Board Jr*. XCVI: (June 1938), 25.

Drinker, P., and Snell, J. R. "Ventilation of Motion Picture Booths." *Jr. Indust. Hyg. & Toxicol*. XX: (Apr. 1938), 321.

Falge, F. M. "Lighting the School Stage." *Nation's Schools*. XXI: (Jan. 1938), 51.

Fuller, C. A. *Air Conditioning*. (New York: The Norman W. Henry Pub. Co., 1938), 400 pp. $4.00.

Gailey, R. "Air Conditioning." *Hygeia*. XVI: (Jan. 1938), 40.

Halsey, R. H. F. "How Much Light for Schoolrooms?" *Am. Sch. Board Jr*. XCVI: (Jan. 1938), 27.

Harrison, W. K., and Fouilhoux, J. A. "Design of Window Areas." *Nation's Schls*. XXI: (Jan. 1938), 55.

Heating, Ventilating, and Air-Conditioning Guide for 1938. (New York: American Society Heat & Ventilation Engineers, 1938), 138 pp. $5.00.

Holy, T. C. "Modern Trends in Heating and Ventilation." *Harvard Ed. Rev*. VII: (May 1937), 369.

Ives, J. E. "Natural and Artificial Lighting for Low Cost Housing." *Pub. Health Rep*. LIII: (June 3, 1938), 895.

Jackson, E. "Light in the Home." *Hygeia*. XVI: (Jan. 1938), 55.

Joseph, E. L. "Air Purification." *Jr. Inst. Heat. Vent. Engrs*. VI: (1938), 170.

Lewis, S. R. *Air Conditioning for Comfort*. (Chicago: Keeney Pub. Co., 1938), 285 pp. $2.50.

"Lighting of Outdoor Recreation Faciliites." *Recreation*. XXXI: (Feb. 1938), 665.

McCord, C. P., and Witheridge, W. N. "The Measurement of Air Conditions." *Jr. A.M.A*. CXI: (1938), 1647.

Noffsinger, F. R. "A Century of Progress in Schoolroom Lighting." *Am. Sch. Board Jr*. XCVI: (Apr. 1938), 41.

Partridge, R. C., and MacLean, D. L. "Radiation as a Factor in Heating Canadian Homes and in Body Heat

Loss. *Jr. Indust. Hyg. & Toxicol.* XX: (Sept. 1938), 482.

"Proposed Lighting Standards." *Nation's Schools.* XXI: (Feb. 1938), 66.

Vogelbach, O. "Practical Schoolroom Ventilation." *Am. Sch. Board Jr.* XCVI: (Jan. 1938), 58.

Wells, W. F. "Air-Borne Infections." *Mod. Hospital.* LI: (July 1938), 66.

——— and Wells, M. W. "Measurement of Sanitary Ventilation." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 343.

Winslow, C.-E.A., Herrington, L. F., and Gagge, A. P. "The Relative Influence of Radiation and Convection upon the Temperature Regulation of the Clothed Body." *Am. Jr. Physiol.* CXXIV: (Oct. 1938), 51.

HISTORY, BIOGRAPHY, RECORDS

Betz, E. J., and Shuler, H. E. "Sports Day Powwow." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 505.

Clarke, H. H. "History of the Research Section of the American Association for Health and Physical Education." Res. Quar. IX: (Oct. 1938), 25.

Collins, F. D. *Popular Sports—Their Origin and Development.* (Chicago: Rand McNally, 1938), (Pamph.). $0.10.

Dambach, J. *Physical Education in Germany.* (Bureau of Publications, Teachers College, Columbia University, 1937), 116 pp. $1.50.

Dublin, L. I., and Lotka, A. J. *Twenty-Five Years of Health Progress.* (New York: Metropolitan Life Insurance Co., 1937), 611 pp.

Elwell-Sutton, R. "Bull-Fight in Provence." *Blackwood's Mag.* CCXLV: (Feb. 1938), 149.

Englhardt, N. L. "Modern Trends in School Planning as a Result of Changing Curriculum." *Am. Sch. Board Jr.* XCVI: (Jan. 1938), 23.

Farley, B. "Physical Educators at Atlanta." *Sch. & Soc'y.* XLVII: (May 2, 1938), 611.

Goulding, A. M. "The National Health Survey in the United States." *Can. Pub. Health Jr.* XXIX: (Aug. 1938), 419.

"Grants for Physical Education in England and Wales." *Sch. and Soc'y.* XLVIII: (Sept. 10, 1938), 328.

"Grants for Physical Training in Great Britain." *Sch. & Soc'y.* XLVII: (June 4, 1938), 723.

"Honor Award Fellows, 1938." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 490.

Ireland, A. G. "Present and Future Development in Health and Physical Education." (in *Yearbook of the New York Soc'y for Experimental Study of Education.* 1938). Reprint, $0.15.

Jackson, C. O. "The Status of Physical Education in the Accredited Secondary Schools of Illinois." Res. Quar. IX: (Mar. 1938), 47.

Koos, L. V. "A Quarter-Century with the Junior College." *Jr. Higher Education.* IX: (Jan. 1938), 1.

Martin, P. S. "New Facts from New World Prehistory." *N. Am. Rev.* CCXLIV: (Spring 1938), 181.

Milestones in Medicine. (New York: Appleton-Century, 1938), 276 pp. $2.00.

Murray, W. D. *History of the Boy Scouts of America.* (New York: Boy Scouts of America, 1937), 574 pp. $3.00.

Nichols, E. C. "Physical Education at Amherst." Res. Quar. IX: (May 1938), 88.

"Olympic Games Marathon of 1904." *World Sports.* VI: (Nov. 1938), 10.

"Physical Education in Great Britain." *Sch. & Soc'y.* XLVII: (Feb. 5, 1938), 187.

"Physical Education for London School Children." *Sch. & Soc'y.* XLVII: (Apr. 2, 1938), 432.

Physical Education in Institutions of Higher Education. (Washington, D.C.: U. S. Office of Educ., Pamph. No. 82), 32 pp. $0.10.

"Physical Training in Poland." *Jr. Health & Phys. Ed.* IX: (June 1938), 348.

"Review of the Year in Interscholastic Athletics." *Ath. Jr.* XVIII: (June 1938), 13.

Rogers, L. T. "Physical Education Carries on." *Jr. Health & Phys. Ed.* IX: (Mar. 1938), 143 .

Roucek, J. S. "Militarization in Czechoslovak Education." *Sch. & Soc'y.* XLVII: (Mar. 5, 1938), 314.

Sigerist, H. E. "The Development of Medicine and Its Trends in the United States; 1636–1936." *New Eng. Jr. Med.* CCXVIII: (Feb. 1938), 325.

Waller, C. E. "A Brief Review of Progress in the Public Health Program." *Health Officer.* II: (Feb. 1938), 472.

Warden, R. D. "In Memoriam—R. Tait McKenzie." *Jr. Health & Phys. Ed.* IX: (June 1938), 375.

Woody, T. "Professionalism and the Decay of Greek Athletics." *Sch. & Society.* XLVII: (Apr. 23, 1938), 521.

Wright, L. H. "When Winter Came to England 100 Years Ago." *Country Life & Sportsman.* LXXIII: (Feb. 1938), 74.

Young, M. L. "Outing Activities at Middlebury College." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 29.

HYGIENE

Aaron, H. *Our Common Ailment. Constipation: Its Causes and Cure.* (New York: Dodge, 1938), 192 pp. $1.50.

Bauer, W. W. *Health, Hygiene and Hooey.* (New York: Bobbs-Merrill, 1938), 322 pp. $2.50.

Benedict, W. L. "Newer Knowledge of Eye Health." *Journal-Lancet.* LVIII: (Apr. 1938), 191.

Fowlkes, J. G., and Jackson, L. Z. and A. S. *Making Life Healthful.* (Philadelphia: Winston, 1938), 400 pp. $1.00.

——— *Success Through Health.* (Philadelphia: Winston, 1938), 352 pp. $1.00.

Haggard, H. W. *The Science of Health and Disease: A Textbook of Physiology and Hygiene.* (New York: Harper, 1938), 594 pp. $3.00.

Hahn, M. L., and Winslow, C.-E. A. *Let's Stay Well.* (New York: Merrill, 1938), 184 pp. $0.72.

Hickman, C. P. *Physiological Hygiene.* (New York: Prentice-Hall, 1937), 493 pp. $3.25.

Lapham, R. F. *Disease and the Man.* (New York: Oxford Univ. Press, 1937), 143 pp. $2.00.

Phair, J. T. *Health—A Handbook for Teachers.* (Toronto: Ryerson Press, 1938), $0.75.

"Science for Humanity's Sake." *Science.* LXXXVII: (Feb. 4, 1938), 118.

Scott, C. M. *Doctors, Disease, and Health.* (Philadelphia: Saunders, 1938), 283 pp. $2.50.

Sharp, W. B. *Practical Microbiology and Public Health.* (St. Louis: Mosby, 1938), 492 pp. $4.50.

Wall, F. P., and Zeidberg, L. D. *Health Guides and Guards.* (New York: Prentice-Hall, 1938), 380 pp. $1.40.

"Winter Health Hazards." *Hygeia.* XVI: (Jan. 1938), 36.

Child and Mother

Aldrich, C. A. and M. M. *Babies are Human Beings.* (New York: Macmillan, 1938), 128 pp. $1.75.

Boyd, J. D. *Nutrition of the Infant and Child.* (New York: Nat'l Med. Book Co., 1937), 198 pp. $3.00.

Brown, A. "Some Factors Concerning the Care of the New-Born." *Can. Pub. Health Jr.* XXIX: (July 1938), 337.

Crothers, B. "Education of the Handicapped Child." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 340.

Heseltine, M. H. "Nutrition Services in Maternal and Child Health Programs Under the Social Security Act." *Am. Jr. Pub. Health.* XXVIII: (July 1938), 813.

de Kruif, P. *The Fight for Life.* (New York: Harcourt, Brace, 1938), 342 pp. $3.00.

Laws, C. H., and Skelley, E. G. "A Maternal Milk Laboratory." *Am. Jr. Nursing.* XXXVIII: (Aug. 1938), 859.

Lenroot, K. F. "The Place of Dental Hygiene in a Maternal and Child-Health Program." *The Child.* III: (Oct. 1938), 75; (Washington: Gov't Prtg. Off.), $0.10.

Ludovici, A. M. *The Truth About Childbirth.* (New York: Dutton, 1938), 294 pp. $2.50.

Mastriano, M. "Guiding Children's Growth." *Hygeia.* XVI: (Apr. 1938), 358.

New, A. L. "The Handicapped Child." *Hygeia.* XVI: (May 1938), 426.

Smith, C. H. "Malnutrition in Child-

hood." *Prev. Med.* VII: (Feb. 1938), 257.
Stewart, C. A. "The Feeding of the Child." *Journal-Lancet.* LVIII: (May 1938), 239.
"Teeth and Their Importance." *Hygeia.* XVI: (Dec. 1938), 1091.
Tregoning, L. "Outwitting Homemaker's Fatigue." *Hygeia.* XVI: (Oct. 1938), 887.
Wangson, O. R. "Maternal and Child Welfare." *Annals of Am. Academy.* CXCVII: (May, 1938), 93.
Woutat, P. H. "Vitamin D Deficiency in Infancy and Childhood." *Journal-Lancet.* LVIII: (Nov. 1938), 493.

Domestic and Personal

Bauer, W. W. *Health, Hygiene and Hooey.* (New York: Bobbs-Merrill, 1938), 322 pp. $2.50.
Boudreau, F. G. "Family Health Goal of Public Health." *Pub. Health Nurs.* XXX: (June 1938), 346.
Britten, R. H. "Housing and Health." *Am. Jr. Pub. Health.* XXVIII: (Aug. 1938), 957.
Connolly, J. I. "Plumbing in Low Cost Housing." *Am. Jr. Pub. Health.* XXVIII: (Aug. 1938), 954.
Coulson, H. M. *Your Living Body.* (London: Pitman & Sons, 1938), 102 pp. 1s. 3d.
Fisher, I., and Emerson, H. *How to Live.* (New York: Funk & Wagnalls, 1938), 422 pp. $2.50.
France, B. "Fitting Feet for Life." *Hygeia.* XVI: (Apr. 1938), 308.
Giles, R. *Sleep! The Secret of Greater Power and Achievement.* (Indianapolis: Bobbs-Merrill, 1938), 290 pp. $1.75.
Haggard, H. W. *Man and His Body.* (New York: Harpers, 1938), 594 pp. $4.00.
Hazen, H. H. "Cosmetics." *Am. Jr. Nurs.* XXXVIII: (July 1938), 791.
House, R .T. "Cold Baths and A Cold Tombstone." *Hygeia.* XVI: (July 1938), 586.
Hull, T. C. "Looking at Health." *Hygeia.* XVI: (Apr. 1938), 323.
Jacobson, E. *You Can Sleep Well: The ABC's of Restful Sleep for the Average Person.* (New York: McGraw-Hill, 1938), 269 pp. $2.00.
——— *Progressive Relaxation.* (Rev. ed.; Chicago: Univ. of Chicago Press, 1938), 494 pp. $5.00.
Hirschfeld, I. *Toothbrush—Its Use and Abuse.* (New York: Dental Items, 1939), 591 pp. $7.50.
Klein, A. and Herz, L. *How to Suntan for Health and Fun.* (Emaus, Pa.: Rodale Press, 1938), 135 pp. $1.00.
Mattison, N. D. "Balance in Sleep." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 23.
Mattison, N. "A New Estimate of Sleep Quality." *Med. Rec., N. Y.* CXLVIII: (1938), 133.
McEachern, M. "Do You Snore?" *Hygeia.* XVI: (Feb. 1938), 148.
Melpolder, J. "Hazards in the Home." *Pub. Health Nurs.* XXX: (Mar. 1938), 165.
Montague, J. F. *How to Conquer Constipation.* (Philadelphia: Lippincott, 1938), 244 pp. $1.50.
Nash, J. B. *Teachable Moments; A New Approach to Health.* (New York: Barnes, 1938), 243 pp. $1.50.
Niemoeller, A. F. *Men Past Forty.* (New York: Harvest House, 1938), 154 pp. $2.00.
Pearl, R. "The Search for Longevity." *Sci. Monthly.* (May 1938), 462.
Rosenthal, M. "Sun Goggles." *Hygeia.* XVI: (July 1938), 591.
"Sleep." *Hygeia.* XVI: (June 1938), 507.
Smith, F. P. "Why Do Teeth Decay?" *Hygeia.* XVI: (Apr. 1938), 320.
"Your Skin." *Hygeia.* XVI: (Feb. 1938), 132.

Community and Public

Barrett, H. "Atmospheric Pollution in Toronto, Canada." *Can. Pub. Health Jr.* XXIX: (Jan. 1938), 1.
Berry, A. E. "A Survey of Milk Control in Cities and Towns in Canada." *Can. Pub. Health Jr.* XXIX: (June 1938), 305.
Campbell, P. S. "Public Health Progress." *Can. Pub. Health Jr.* XXIX: (July 1938), 321.
Carter, D. J. "The Public Health Nurse and Orthopedic Nursing Care." *Am. Jr. Pub. Health.* XXVIII: (Apr. 1938), 458.

Chadwick, H. D., and Lombard, H. L. "A State Cancer Program." *Am. Jr. Pub. Health.* XXVIII: (Jan. 1938), 14.

"Consumption Habits of the American People." *U. S. Monthly Labor Rev.* XLVI: (Mar. 1938), 608.

Copeland, R. S. "Protection for the Public." *Sci. Am.* CLVIII: (Feb. 1938), 88.

Currie, J. R. *Manual of Public Health.* (Baltimore: Wood, 1938), 324 pp. $5.00.

Davies, J. E. *Fundamentals of Housing Study.* (New York: Columbia Teachers College, 1938), 355 pp. $2.85.

Defries, R. D. "Recent Health Legislation in Canada." *Can. Pub. Health Jr.* XXIX: (Apr. 1938), 180.

"Drinking Cups and Drinking Fountains." *Amer. City.* LIII: (Mar. 1938), 15.

Erb, R. C. *Poisoning the Public.* (Philadelphia: Dorrance, 1937), 219 pp. $2.00.

Fellers, R. V. "Unsterilized Drinking Glasses a Menace to Public Health." *Amer. City.* LIII: (Aug. 1938), 53.

Fishbein, M. "Modern Medical Charlatans." *Hygeia.* XVI: (Jan. 1938), 21; (Feb. 1938), 113.

Graves, L. M., and Fletcher, A. H. "Problems of a Housing Enforcement Program." *Am. Jr. Pub. Health.* XXVIII: (June 1938), 695.

Group Hospitalization: A Report. (New York: American Medical Ass'n, 1937), 296 pp. $0.75.

Hardenbergh, W. A. *Water Supply and Purification.* (Scranton, Pa.: International Textbook Co., 1938), 458 pp. $4.00.

Heiser, V. G. *American Doctor's Odyssey.* (New York: Norton, 1938), 306 pp. $1.40 (Student Edition).

Hersey, H. S. "Incinerators for Garbage and Refuse Disposal." *Amer. City.* LIII: (Feb. 1938), 61.

Hojer, A. "Public Health and Medical Care." *Annals of Am. Acad'y.* CXCVII: (May 1938), 104.

Howell, M. G. "Preparing the Nurse to Meet Community Needs in Public Health." *Am. Jr. Pub. Health.* XXVIII: (May 1938), 566.

"Hygiene of Housing." *The Commonhealth* (Mass. Dept. Public Health). XXV: (Apr.-May-June 1938), 95.

"Improved Water Softening with Precipitators." *Amer. City.* LIII: (Mar. 1938), 55.

Klassen, C. W., and Miller, A. P. "Essentials of an Effective State Plan and Program of Activities for Flood Sanitation." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 263.

Lawrence, A. "Clean Flushed Streets An Aid to Community Health." *Amer. City.* LIII: (May 1938), 41.

Leathers, W. S. "Public Health Degrees and Certificates Granted in 1937." *Am. Jr. Pub. Health.* XXVIII: (July 1938), 863.

Lehman, H. H. "An Equal Opportunity for Health." *Am. Jr. Pub. Health.* XXVIII: (Jan. 1938), 1.

Macdonald, R. St. J. "Progress in Housing and Health." *Can. Pub. Health Jr.* XXIX: (Aug. 1938), 377.

"Many States Need Housing Authority Laws." *Amer. City.* LIII: (Jan. 1938), 5.

Marden, K., Curry, J. M., Horowitz, L. J., and Horning, B. G. "Administrative Control of Food Handlers and Places Dispensing Food and Drinks." *Am. Jr. Pub. Health.* XXVIII: (Nov. 1938), 1277.

Marquette, B. "Public Relations for Public Health." *Health Officer.* II: (Jan. 1938), 418.

Marsh, L. C., *et al. Health and Unemployment.* (New York: Oxford, 1938), 243 pp. $3.00.

McMahon, J. F. "What to do About Dust?" *Sci. Am.* CLVIII: (Jan. 1938), 26.

Meleney, H. E. "Certain Criteria in the Qualifications and Preparation of Health Officers." *Am. Jr. Pub. Health,* XXVIII: (Apr. 1938), 423.

Miller, A. P., and Garthe E. C. "A Report of 1,000 Tests on Drinking Water Found on Trains. *Pub. Health Rep.* LIII: (Feb. 25, 1938), 300.

"Mosquito Extermination." *Amer. City,* LIII: (June 1938), 67.

Mountin, J. W., and O'Hara, H. "The Unequal Distribution of Opportuni-

ties for Health." *Pub. Health Rep.* LIII: (Apr. 1, 1938), 485.

Oberwager, J. "Supervision of Fumigation and Extermination." *Am. Jr. Public Health.* XXVIII: (May 1938), 633.

Parran, T. "The Health of the Nation." *Am. Jr. Public Health.* XXVIII: (Dec. 1938), 1376.

——— "The Work and Aims of the United States Public Health Service." *New Eng. Jr. Med.* CCXIX: (July 21, 1938), 75.

Post, L. W. "Attainable Standards in Housing." *Annals of Am. Academy.* CXCIX: (Sept. 1938), 128.

——— *The Challenge of Housing.* (New York: Farrar & Rinehart, 1938), 309 pp. $3.50.

"Refuse Collection in 28 Cities in the United States." *Amer. City.* LIII: (July 1938), 57.

Riley, R. H. "The Health Department in the Field of Medicine." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 303.

Sanborn, J. R. "Suitable Paper Wrappers and Containers for Foods." *Am. Jr. Pub. Health.* XXVIII: (May 1938), 571.

Schereschewsky, J. W. "Nation-Wide Organization for Cancer Prevention and Control." *Pub. Health Rep.* LIII: (June 17, 1938), 961.

Sharp, W. B. *Microbiology and Public Health.* (St. Louis: Mosby, 1938), 492 pp. $4.50.

Steel, E. W. *Water Supply and Sewerage.* (New York: McGraw-Hill, 1938), 653 pp. $5.00.

Straus, M. W., and Wegg, T. *Housing Comes of Age.* (New York: Oxford Univ. Press, 1938), 259 pp. $2.75.

Turner, T. B. "Qualifications of a Venereal Disease Control Officer." *Am. Jr. Pub. Health.* XXVIII: (May 1938), 559.

Whittaker, H. A. "Principles Governing Sanitation of Isolated Dwellings." *Pub. Health Rep.* LIII: (June 3, 1938), 902.

Winslow, C.-E. A. "Opportunities and Responsibilities of the Health Officer in Connection with The Federal Housing Acts." *Am. Jr. Public Health.* XXVIII: (Nov. 1938), 1269.

——— "Basic Principles of Healthful Housing." *Am. Jr. Public Health.* XXVIII: (Mar. 1938), 351.

——— "Organizing for Better Community Service." *Am. Jr. Nursing.* XXXVIII: (July 1938), 761.

Wright, E. "Control of Nuisances." *Am. Jr. Pub. Health.* XXVIII: (May 1938), 579.

Industrial

Alexander, L. "Clinical and Neuropathological Aspects of Electrical Injuries." *Jr. Indust. Hyg. & Toxicol.* XX: (Mar. 1938), 191.

Arnold, L. "A Sanitary Study of Commercial Laundry Practices." *Am. Jr. Pub. Health,* XXVIII: (July 1938), 839.

Bedell, A. J. "Eyes and the Office Worker." *Hygeia.* XVI: (Mar. 1938), 211.

Berens, C. "Eyes in Industry." *Hygeia.* XVI: (Feb. 1938), 125.

Bloomfield, J. J. "Development of Industrial Hygiene in the United States." *Am. Jr. Pub. Health.* XXVIII: (Dec. 1938), 1388.

Bristol, L. D. "Industrial Hygiene." *Am. Jr. Pub. Health.* XXVIII: (Sept. 1938), 1080.

Bulmer, F. M. R. "Objectives of Industrial Hygiene." *Can. Pub. Health Jr.* XXIX: (July 1938), 345.

Chenoweth, L. B., and Machle, W. *Industrial Hygiene—A Handbook of Hygiene and Toxicology for Engineers and Plant Managers.* (New York: Crofts, 1938), 235 pp. $2.00.

Crain, R. B., and Missal, M. E. "The Employee with Heart Disease, His Management in Industry." *Jr. A.M.A.* CX: (Jan. 1, 1938), 1.

Cressman, P. L., McCarthy, J. A., *et al. Industrial Safety Education in School.* (New York: Metropolitan Life Insurance Co., 1938), 48 pp. (gratis).

Dobbie-Bateman, M. L. "Sickness Absenteeism." *Indus. Welfare.* XX: (Oct. 1938), 403.

Easom, H. F., and Trice, M. F. "Development of an Industrial Hygiene Program in a State Health Department."

Am. Jr. Pub. Health. XXVIII: (May 1938), 610.

Gafafer, W. M. "The Age of Female Workers in Different Geographic Regions." *Pub. Health Rep.* LIII: (Jan. 7, 1938), 4.

——— and Frasier, E. S. "Disabilities Among Employees of a Public Utility." *Pub. Health Rep.* LIII: (July 29, 1938), 1273.

——— "Sickness Among Male Industrial Employees During 1937." *Pub. Health Rep.* LIII: (Apr. 8, 1938), 519.

Gaetjens, A. K. "Industry Needs More Light." *Sci. Am.* CLVIII: (Apr. 1938), 197.

Haythorn, S. R., and Meller, H. B. "Necropsy Evidences on the Relation of Smoky Atmosphere to Pneumonia." *Am. Jr. Pub. Health.* XXVIII: (Apr. 1938), 479.

Klein, E. E. *Work Accidents to Minors in Illinois.* (Chicago: Univ. Chicago Press, 1938), 256 pp. $1.00.

Latimer, H. A. "The Public Health Nurse in Industry." *Can. Pub. Health Jr.* XXIX: (Feb. 1938), 74.

"Laws Limiting Hours of Employment for Men, as of Jan. 1, 1938." *U. S. Monthly Lab. Rev.* XLVI: (Feb. 1938), 462.

Levy, L. H. "Occupational Hernia." *Indust. Med.* VII: (Feb. 1938), 75.

Masterman, A. T. "Air Purification in Inhabited Rooms by Spraying or Atomizing Hypochlorites." *Jr. Indust. Hyg. & Toxicol.* XX: (Apr. 1938), 278.

Mayers, M. R. "Carbon Monoxide Poisoning in Industry and its Prevention." (N. Y. State Dept. Labor Div. Indust. Hyg. Special Bull. No. 194, 1938).

Occupational Disease Symposium. (Chicago: Northwestern University Medical School, 1937), 86 pp.

"Safety Standards for Motion-Picture-Machine Operators." *U. S. Monthly Lab. Rev.* XLVI: (Jan. 1938), 115.

Sander, O. A. "Lung Findings in Foundry Workers—A Four Year Survey." *Am. Jr. Pub. Health.* XXVIII: (May 1938), 601.

Sayers, R. R. "Harmful Industrial Dusts." *U. S. Pub. Health Rep.* LIII: (Feb. 11, 1938), 217.

——— and Bloomfield, J. J. "Public Health Aspects of Industrial Hygiene." *Jr. A.M.A.* CXI: (Aug. 20, 1938), 679.

Schulze, C. R. "Industrial Hygiene Applied to the Clothing Manufacturing Industry." *Am. Jr. Pub. Health.* XXVIII: (Apr. 1938), 476.

Selby, C. D. "Health Maintenance in Industry." *Am. Jr. Pub. Health.* XXVIII: (Nov. 1938), 1328.

Sundius, N., and Bygden, A. "Isolation of the Mineral Dust in Lungs and Sputum. *Jr. Indust. Hyg. & Toxicol.* XX: (May 1938), 351.

Vernon, H. M. "Hours and Efficiency: Problems of Industrial Fatigue." *Times Trade and Engr'g.* XLII: (Feb. 1938), 9.

Watson, H. H. "The Effect of Water on the Production of Industrial Dust." *Jr. Indust. Hyg. and Toxicol.* XX: (Feb. 1938), 155.

Yaglou, C. P. "Sanitary Aspects of Air Conditioning." *Am. Jr. Pub. Health.* XXVIII: (Feb. 1938), 143.

"Young and Old at the Employment Office." *U. S. Monthly Lab. Rev.* (Jan. 1938), 3.

Mental

Anderson, C. M. *Emotional Hygiene: The Art of Understanding.* (Philadelphia: Lippincott, 1937), 242 pp. $2.00.

Berry, C. S. "Mental Hygiene and the Physically Handicapped." *Crippled Children.* XVI: (June 1938), 43.

Bills, A. G. "Fatigue in Mental Work." *Physiol. Rev.* XVII: (July 1937), 436.

Bluemel, C. S. *The Troubled Mind: A Study of Nervous and Mental Illnesses.* (Baltimore: Wood, 1938), 520 pp. $3.50.

Chappell, M. N. *In the Name of Common Sense: Worry and Its Control.* (New York: Macmillan, 1938), 192 pp. $1.75.

Davis, J. E. *Play and Mental Health: Principles and Practices for Teachers.* (New York: Barnes, 1938), 202 pp. $2.50.

Doyle, A. M. "Practical Aspects of

Community Mental Health." *Can. Pub. Health Jr.* XXIX: (Feb. 1938), 80.

Faris, R. E. L., and Dunham, H. W. *Mental Disorders in Urban Areas.* (Chicago: Univ. Chicago Press, 1938), 270 pp. $2.50.

Foster, S. "Mental Health Needs in Children's Institutions." *Ment. Hyg.* XXII: (Jan. 1938), 57.

Frank, L. K. "Fundamental Needs of the Child." *Ment. Hyg.* XXII: (July 1938), 353.

Freeman, A. W. "Mental Hygiene and the Health Department." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 241.

Griffin, J. D. M. "The Contribution of Child Psychiatry to Mental Hygiene." *Can. Pub. Health Jr.* XXIX: (Nov. 1938), 550.

Harper, E. O., and Palmer, H. D. "College Mental Hygiene Methods." *Proc. Am. Student Health Ass'n,* (1937), 26.

Hart, J. K. *Mind in Transition.* (New York: Covici-Friede, 1938), 413 pp. $3.50.

Hincks, C. M. "Achievements in Mental Hygiene and Promising Leads for Further Endeavor." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 251.

Hinsie, L. E. *Concepts and Problems of Psychotherapy.* (New York: Columbia Univ. Press, 1937), 199 pp. $2.75.

Kanner, L. "Mental Hygiene during the Pre-School Period." *Prevent. Med.* VII: (Mar. 1938), 281.

Landis, C., and Page, J. D. *Modern Society and Mental Disease.* (New York: Farrar & Rinehart, 1938), 190 pp. $1.50.

Lawton, G. "Mental Hygiene and Scholarship." *Sch. & Soc'y.* XLVIII: (Sept. 3, 1938), 304.

McChie, B. T. "The Place of Mental Hygiene in Public Health." *Can. Pub. Health Jr.* XXIX: (Apr. 1938), 153.

McLean, D. *Knowing Yourself and Others: Mental Hygiene for Young People.* (New York: Holt, 1938), 275 pp. $1.40.

Meyers, C. S. "The Mental Hygiene of Intellectual Work." *Occupat. Psych.* XII: (Winter, 1938), 5.

Prescott, D. A. *Emotion and the Educative Process.* (Washington, D. C.: American Council on Education, 1938), 293 pp. $1.50.

Raphael, T., Gordon, M. A., and Dawson, E. M. "Mental Hygiene in American Colleges and Universities." *Ment. Hyg.* XXII: (Apr. 1938), 221.

Roberts, H. *The Troubled Mind.* (New York: Dutton, 1938), 284 pp. $2.00.

Rosanoff, A. J. *Manual of Psychiatry and Mental Hygiene.* (New York: Wiley, 1938), 1091 pp. (7th ed.) $7.50.

Russell, J. I. *The Occupational Treatment of Mental Illness.* (Baltimore: Wood, 1938), 231 pp. $2.50.

Ryan, W. C. "Family and School in Mental Health." *Parent Ed.* IV: (Apr. 1938), 179.

——— *Mental Health Through Education.* (New York: Commonwealth Fund, 1938), 315 pp. $1.50.

Sherman, M. *Mental Conflicts and Personality.* (New York: Longmans, Green, 1938), 319 pp. $2.25.

Soule, M. H. "Symposium of Mental Health." *Science.* LXXXVIII: (Sept. 30, 1938), 302.

Truitt, R. P. "Some Emotional Problems Resulting from Physical Disabilities." *Nat'l Rehabil. News.* IV: (Feb. 1938), 7.

Williams, J. H. "Mental Diagnosis." *Education.* LVIII: (May 1938), 515.

Rural

Atwater, R. M. "The Control of Tuberculosis in Rural Areas." *Can. Pub. Health Jr.* XXIX: (Feb. 1938), 53.

Kimbrough, R. C., Cowill, D. M., and Bowerman, E. P. "Rural Syphilis—A Localized Outbreak." *Am. Jr. Pub. Health.* XXVIII: (June 1938), 756.

Stampar, A. "Observations of a Rural Health Worker." *New Eng. Jr. Med.* CCXVIII: (June 16, 1938), 991.

School

Adams, L. O. "Care and Maintenance of Wood Floors in Schools." *Am. Sch. Board Jr.* XCVII: (Oct. 1938), 49.

Andrus, R. "The Nursery School, A Child Welfare Center." *Progress Ed.* XV: (Oct. 1938), 469.

Barnes, M. D. *Fit to Teach.* (Teachers'

Health) (Washington, D.C.: Nat'l Ed. Ass'n., 1938), 276 pp.

Barrows, A. *The School Building Situation and Needs.* (Washington, D.C.: U. S. Gov't Prtg. Office, Bul. 1937, No. 35, 1938), 62 pp.

Bennett, H. E. "The Battle of the Seating Equipment." *Am. Sch. Board Jr.* XCVII: (July 1938), 27.

Bent, R. E. "Meeting Physical Education Requirements." *Ath. Jr.* XIX: (Nov. 1938), 37.

Campbell, L. E. "Popularizing College Physical Education Through the Double Period." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 242.

Chayer, M. E. *School Nursing: A Contribution to Health Education.* (New York: Putnam, 1937), 329 pp. $3.00.

Chenoweth, L. B., and Selkirk, T. K. *School Health Problems.* (New York: Crofts, 1937), 387 pp. $3.00.

Cole, H. A. "The Central Council of Recreative Physical Training and its Work." *Jr. Phy. Ed. & Sch. Hyg.* XXX: (Nov. 1938), 198.

Copp, H. W. "Care of Gymnasium Floors." *Jr. Health & Phys. Ed.* IX: (Feb. 1938), 94.

Cowell, C. C. "Suggested Index of Social Adjustment in High School." *Ed. Res. Bull.* XVII: (Jan. 19, 1938), 10.

Creech, H. "Advantages of Hardwood Block Floors in School Construction." *Am. Sch. Board Jr.* XCVI: (Jan. 1938), 59.

Englehardt, N. L. "School Buildings for Community Use." *Jr. Adult Education.* X: (Apr. 1938), 154.

Evenden, E. S., Strayer, G. D., and Engelhardt, N. L. *Standards for College Buildings.* (New York: Teachers College, 1938), 226 pp. $2.25.

Foster, E. M. "Schools and School Buildings." *Sch. Life.* XXIII: (Jan. 1938), 145.

Gudakunst, D. W. "The Private Physician in the School." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 207.

Harbeson, J. W. "Planning Better Plants for Upper Secondary Schools." *Am. Sch. Board Jr.* XCVI: (Jan. 1938), 64.

Harrison, W. K., and Fouilhoux, J. A. "Reducing the Cost of School-Building Construction." *Am. Sch. Board Jr.* XCVI: (Jan. 1938), 49.

Jones, M. C. "Guiding the Adolescent." *Progress. Ed.* XV: (Dec. 1938), 605.

Kinley, F. L. "Findlay Schools Survey Children's Eyes." *Am. Sch. Board Jr.* XCVII: (Oct. 1938), 53.

Klein, H., and Palmer, C. E. "A Study of Dental Caries in School Children, by Sex." *Pub. Health Rep.* LIII: (Sept. 23, 1938), 1685.

——— and Knutson, J. W. "Dental Status and Needs of Elementary School Children." *Pub. Health Rep.* LIII: (May 1938), 751.

Knutson, J. W., and Klein, H. "Analysis of Data on Tooth Mortality Found in School Children." *Pub. Health Rep.* LIII: (June 24, 1938), 1021.

Lescaze, W. "Modern Buildings for Modern Education." *Progress Ed.* XV: (Apr. 1938), 332.

Loy, D. T., and Husband, M. W. "Student Housing Survey." RES. QUAR. IX: (Mar. 1938), 100.

McDonough, T. E., and Sifert, E. R. "Stadium Construction." *Ath. Jr.* XIX: (Sept. 1938), 26.

Martsolf, A. L. and L. L. "A Suggested Design for an Activity School Unit." *Am. Sch. Board Jr.* XCVI: (Jan. 1938), 25.

Mueller, G. H. "School Cafeteria Bogeys." *Am. Sch. Board Jr.* XCVII: (July 1938), 29.

Mueller, G. W. "The Problems of Physical Education In Secondary Schools." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 484.

Musick, W. E. "Color in Schoolroom Decoration." *Am. Sch. Board Jr.* XCVI: (Feb. 1938), 45; (July 1938), 43.

Nyswander, D. B. "Practical Procedures in School Health Service" *Am. Jr. Public Health.* XXVIII: (Mar. 1938), 334.

Payne, E. G. "The Schools and Child Health." *Jr. Ed'l Sociol.* XI: (May 1938), 516.

Potter, M. E. "Serving Summer School Students." *Jr. Health & Phys. Ed.* IX: (June 1938), 367.

Rogers, J. F. *The School Custodian.* (Washington, D.C.: Supt. Documents,

Office of Education, 1938), 44 pp. $0.10. pa.

—— Student Interests and Needs in Hygiene. (Washington, D.C.: Supt. Documents, Office of Education, Bull. 1937 No. 16), 21 pp. $0.10.

Rosenson, W. "Neglected Health Factors in Public Schools." *Jr. Sch. Health.* VII: (Mar. 1938), 61.

Schmidt, E. R., and Joachim, F. G. "The Student Health Problem of Appendicitis." *Journal-Lancet.* LVIII: (July 1938), 329.

"School Medical Inspection or the Periodic Health Examination?" *Health Officer.* III: (Sept. 1938), 109. (Washington: U. S. Public Health Service).

Tracy, A. M. "The Administration of the School Lunchroom." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 475.

Uhler, W. P., Jr. "Movable School Furniture and Sight Conservation." *Am. Sch. Board Jr.* XCVII: (July 1938), 22.

Ross, A. R. "Teaching Children to Cooperate with the Local Board of Health." *Hygeia.* XVI: (Apr. 1938), 359.

Samuel C. "Advice on Asphalt Tile Floors." *Am. Sch. Board Jr.* XCVII: (Aug. 1938), 27.

Schmidt, H. W. "Some Blunders in School-Building Planning." *Am. School Board Jr.* XCVI: (Jan. 1938), 29.

Schultz, F. G. "Observations on the Use of Bakelite Floor Finishes." *Am. Sch. Board Jr.* XCVI: (Mar. 1938), 49.

Schwitalla, A. M. "Student Health Service in the University." *Proc. Am. Student Health Ass'n.*, 1937), 16.

Storey, E. J. "Control of Colds in Schools." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 35.

"Student Health." *Hygeia.* XVI: (Sept. 1938), 789.

Student Health Service in Institutions of Higher Learning. (Washington, D. C.: U. S. Office of Education, Supt. of Documents, Bull. 1937, No. 7), 61 pp. $0.10.

Van Buskirk, E. F. "The Use of a Student Inquiry Form for Evaluating a Course in College Hygiene." *Res. Quar.* IX: (Mar. 1938), 154.

Wiley, W. E. "Model Classrooms of 1937." *Am. Sch. Board Jr.* XCVI: (Jan. 1938), 50.

Williamson, P. B. "Visual Education for Schools," *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 278.

Social

Barnes, K. C. and D. F. *Sex, Friendship and Marriage.* (London: G. Allen & Unwin, 1938), 205 pp. $2.00.

Bromley, D. D., and Britten, F. H. *Youth and Sex: A Study of 1300 College Students.* (New York: Harper, 1938), 303 pp. $3.00.

Cady, L. D. "Antenuptial Examination Laws." *Am. Jr. Nursing.* XXXVIII: (July 1938), 777.

"Can Divorce Be Successful?" *Harper's.* CLXXVI: (Feb. 1938), 255.

Davis, M. M. "Social Medicine as a Field for Social Research." *Am. Jr. Sociol.* XLIV: (Sept. 1938), 274.

Highfill, J. V., and Joy, B. D. *Situations, Problems, and Interests of Unmarried Rural Young People, 16–25 Years of Age.* (Fayetteville, Ark.: Univ. of Arkansas, 1938), 33 pp. Ext. Cir. No. 417.

Kaley, L. B. "This Business of Abortion." *Forum.* C: (July 1938), 33.

Long, W. B., and Goldberg, J. A. *Handbook on Social Hygiene.* (Philadelphia: Lea & Febiger, 1938), 422 pp. $4.00.

Moulton, F. R. *Syphilis.* (Lancaster, Pa.: Science Press, 1938), 193 pp. $2.50.

Nelson, N. A., and Crain, G. L. *Syphilis, Gonorrhea and the Public Health.* (New York: Macmillan, 1938), 359 pp. $3.00.

Perrott, G. St. J. "Health Problems of Low Income Families." *Health Officer.* II: (Feb. 1938), 488.

Rice, T. B. "The Choice of a Marriage Mate." *Hygeia.* XVI: (Feb. 1938), 122.

"Social Diseases." *Hygeia.* XVI: (Jan. 1938), 9.

Stix, R. K., and Wiehl, D. G. "Abortion and the Public Health." *Am. Jr.*

Public Health. XXVIII: (May 1938), 621.

Swift, E. H. *Step by Step in Sex Education.* (New York: Macmillan, 1938), 207 pp. $2.00.

Terman, L. M. *Psychological Factors in Marital Happiness.* (New York: McGraw-Hill, 1938), 474 pp. $4.00.

"Thrice Married." *Harper's.* CLXXVI: (Apr. 1938), 545.

Tietz, E. B., and Weichert, C. K. *The Art and Science of Marriage.* (New York: McGraw-Hill, 1938), 279 pp. $2.50.

Victor, D. *The Expectant Father's Handbook.* (Indianapolis: Bobbs-Merrill, 1938), 170 pp. $1.50.

Young, R. "Monogamy for Men." *Forum.* C: (Sept. 1938), 104.

ORGANIZATION, ADMINISTRATION, SUPERVISION

"American Association for Health, Physical Education and Recreation." *Sch. & Soc'y,* XLVIII: (Oct. 22, 1938), 523.

"American Medical Association and the Group Health Association, Inc." *Science.* LXXXVIII: (Aug. 5, 1938), 124.

Blair, H. *Physical Education Facilities for the Modern Junior and Senior High School."* (New York: Barnes, 1938), 174 pp. $2.50.

Boyd, S. R. "A Plan for Grading." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 510.

"Community Recreation Leadership, Facilities and Activities in 1937." *Recreation.* XXXII: (June 1938), 124.

"Constitution and By-Laws of American Association for Health, Physical Education, and Recreation." *Jr. Health & Phys. Ed.* IX: (June 1938), 372.

Cozens, F. W. "The Administrator and Physical Education." *Jr. Health & Phys. Ed.* IX: (June 1938), 341.

"Fit to Teach." *Jr. Nat'l Ed. Assn.* XXVII: (Mar. 1938), 71.

Garrison, J. R. "The Alabama Coordinating Plan." *Jr. Health & Phys. Ed.* IX: (Feb. 1938), 98.

Lee, M. *The Conduct of Physical Education.* (New York: Barnes, 1937), 561 pp. $3.00.

"Modern Elementary School Building." *Am. Sch. Board Jr.* XCVII: (Sept. 1938), 37.

"National Health Conference." *Am. Labor Leg. Review.* XXVIII: (June 1938), 75.

Nordly, C. L. *The Administration of Intramural Athletics for Men in Colleges and Universities.* (New York: Teachers College, Columbia University, 1937), 134 pp. $1.60.

"Objectives and Student Interests in Physical Education." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 5.

Voltmer, E. F., and Esslinger, A. A. *The Organization and Administration of Physical Education.* (New York: Crofts, 1938), 467 pp. $3.00.

Williams, J. F., Dambach, J. I., and Schwendener, N. *Methods in Physical Education.* (Philadelphia: Saunders, 1937), 277 pp. $2.50.

Wray, J. E. *How to Organize a League, Manage a Team, Captain a Team, Coach a Team, Score a Game, Arrange Signals.* (New York: Am. Sports, 1937), $0.25.

Wright, G. B. "The Administrator Looks at Dancing." *Ed. Dance.* I: (May 1938), 7.

PHILOSOPHY, PRINCIPLES, PROBLEMS

Danzig, A. "Are Amateurs Hypocrites?" *N. Am. Rev.* CCXLVI: (Autumn 1938), 198.

Davis, J. E. "Are We Teaching Our Children to Fight in Their Play?" *Ment. Hyg.* XXII: (July 1938), 421.

Keith, E. C. *Sportsman's Creed.* (New York: Scribner's, 1938), 205 pp. $5.00.

Ekstrom, J. "Physical Education as an Accredited Course." *Wisconsin Jr. Ed.* LXX: (Jan. 1938), 239.

McCloy, C. H. "In Quest of Skills." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 478.

"Objectives and Student Interests in Physical Education." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 5.

"Principles Governing the Conduct of Athletics at Harvard, Yale and Princeton Universities." *Sch. and Soc'y.* XLVIII: (July 2, 1938), 8.

"Problems in Recreation." *Leisure.* V: (Oct. 1938), 34.

"Problems Related to Administrative and Teaching Procedures in Hygiene and Physical Education." RES. QUAR. IX: (Mar. 1938), 67.

Root, D. O. "A Philosophy for Athletic Coaches." *Ath. Jr.* XVIII: (May 1938), 35.

Sharman, J. R. *Modern Principles of Physical Education.* (New York: Barnes, 1937), 208 pp. $2.00.

Sonner, G. "Principles for Making Health Units in the Primary Grades." *Hygeia.* XVI: (May 1938), 455.

Streicher, M. "The Principle of Human Movement Basic to Physical Training in Schools." *Jr. Phy. Ed. & Sch. Hyg.* XXX: (Nov. 1938), 168.

Van Why, J. "Educating the Spectator." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 411.

Wayman, A. R. *Modern Philosophy of Physical Education.* (Philadelphia: Saunders, 1938), 231 pp. $2.25.

Williams, J. F. *Principles of Physical Education.* (3rd ed.; Philadelphia: Saunders, 1938), 450 pp. $3.00.

PHYSIOLOGY, ANATOMY, ETC.

Adolph, E. F. "Heat Exchanges of Man in the Desert." *Am. Jr. Physiol.* CXXIII: (Aug. 1938), 486.

——— and Dill, D. B. "Observations on Water Metabolism in the Desert." *Am. Jr. Physiol.* CXXIII: (Aug. 1938), 369.

Apperly, F. L. "Blood Changes and Hyper-Ventilation at Moderate Altitudes." *Am. Jr. Physiol.* CXXII: (Apr. 1938), 179.

Ayman, D., and Goldshine, A. D. "Cold as a Standard Stimulus of Blood Pressure." *New Eng. Jr. Med.* CCXIX: (Oct. 27, 1938), 650.

Barcroft, J. *The Brain and Its Environment.* (New Haven: Yale University Press, 1938), 116 pp. $2.00.

Bean, J. W., and Bohr, D. F. "High Oxygen Effects on Isolated Striated Muscle. *Am. Jr. Physiol.* CXXIV: (Dec. 1938), 576.

Dill, D. B., Hall, F. G., and Edwards H. T. "Changes in Composition of Sweat During Acclimatization to Heat." *Am. Jr. Physiol.* CXXIII: (Aug. 1938), 412.

Dill, D. B. *Life, Heat and Altitude; Physiological Effects of Hot Climates and Great Heights.* (Boston: Harvard University Press, 1938), 211 pp. $2.50.

Donnelly, J. L. "On the Metabolism of Glucose." *Am. Jr. Physiol.* CXXIII: (Aug. 1938), 448.

DuBois, E. F. *Mechanisms of Heat Loss and Temperature Regulation.* (Stanford Univ.: Stanford Univ. Press, 1937), 95 pp. $2.25.

Erlanger, J., and Blair, E. A. "Comparative Observations on Motor and Sensory Fibers." *Am. Jr. Physiol.* CXXI: (Feb. 1938), 431.

Eulenburg-Wiener, R. V. *Fearfully and Wonderfully Made.* (New York: Macmillan, 1938), 472 pp. $3.50.

Ewart, E. D. *A Guide to Anatomy* (for Students of Medical Gymnastics, Massage and Medical Electricity). (London: H. K. Lewis & Co., 1938), 342 pp. 12s. 6d. ($3.50.)

Fishbein, M. "Harmonious Hormones." *Sci. Am.* CLVIII: (Feb. 1938), 86.

Franklin, K. J., and Maher-Loughnan, G. P. "The 'Circular' Musculature of the Small Intestine." *Jr. Physiol.* XCIV: (Dec. 1938), 426.

Gagge, A. P., Winslow, C.-E. A., and Herrington, L. P. "The Influence of Clothing on the Physiological Reactions of the Human Body to Varying Environmental Temperatures." *Am. Jr. Physiol.* CXXIV: (Oct. 1938), 30.

Griffith, J. Q., Jr. "Blood Volume and Blood Pressure Following Administration of Fluid." *Am. Jr. Physiol.* CXXII: (Apr. 1938), 140.

Hackensmith, C. W. "The Latent Power of Sugars." *Ath. Jr.* XVIII: (Mar. 1938), 40.

Harrison, R., and Dorcus, R. M. "Is Rate of Voluntary Bodily Movement Unitary?" *Jr. Gen'l Psychol.* XVIII: (Jan. 1938), 31.

Hemingway, A. "The Patterns of Limb Movements." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Mar. 1938), 4.

Hoff, H. E. "Recent Progress in Physiology." *New Eng. Jr. Med.* CCXVIII: (June 9, 1938), 964.

Hubbard, A. W., and Stetson, R. H. "An Experimental Analysis of Human Locomotion." *Am. Jr. Physiol.* CXXIV: (Nov. 1938), 300.

Irving, L. "The Insensitivity of Diving Animals to CO_2." *Am. Jr. Physiol.* CXXIV: (Dec. 1938), 729.

Kermack, W. O., and Eggleton, P. *The Stuff We're Made Of.* (New York: Longmans, Green, 1938), 341 pp. $3.20.

Kerridge, P. M. T. "Recent Advances in Knowledge Concerning Hearing and Speech." *Physiol. Rev.* XVIII: (Jan. 1938), 59.

Kleitman, N., Titelbaum, S., and Feiveson, P. "The Effect of Body Temperaature on Reaction Time." *Am. Jr. Physiol.* CXXI: (Feb. 1938), 495.

Krogman, W. M. "The Skeleton Talks." *Sci. Am.* CLIX: (Aug. 1938), 61.

MacLeod, J. "Seasonal Variations in the Normal Polynuclear Count in Man." *Am. Jr. Physiol.* CXXII: (May 1938), 520.

McFarland, R. A. *The Effects of Oxygen Deprivation (High Altitude) on the Human Organism.* (Washington, D.C.: Rept. No. 13, Bur. of Air Commerce, Safety & Planning Div., U. S. Dept. Commerce, 1938).

Menkin, V. "The Role of Inflammation in Immunity." *Physiol. Rev.* XVIII: (July 1938), 366.

Mulliner, M. R. *Elementary Anatomy and Physiology.* (Philadelphia: Lea & Febiger, 1938), 452 pp. $4.75.

"Neuromuscular Function and Development." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 37.

Newman, B. M. "Electrical Rhythms of the Human Brain." *Sci. Am.* CLIX: (Oct. 1938), 186; (Nov. 1938), 236.

——— "Enzymes: Keys to Life and Death." *Sci. Am.* CLVIII: (Mar. 1938), 138.

Rubin, S. H. "The Determination of the Buffer Alkali in Cutaneous Blood." *Jr. Biol. Chem.* CXXVI: (Dec. 1938), 679.

Seegers, W. H. "Nitrogen Excretion on a Nitrogen-Free Diet." *Am. Jr. Physiol.* CXXIII: (July 1938), 233.

Slonaker, J. R. "The Effect of Different Per Cents of Protein in the Diet in Successive Generations." *Am. Jr. Physiol.* CXXIII: (Aug. 1938), 526.

Speidel, C. C. "Studies of Living Muscles." *Am. Jr. Anatomy.* LXII: (Jan. 1938), 179.

Sure, B., and DeWitt, J. B. "The Oxygen Uptake of Tissues in Vitamin Deficiencies." *Jr. Biol. Chem.* CXXVI: (Nov. 1938), 287.

Talbot, F. B. "Basal Metabolism Standards for Children." *Am. Jr. Dis. Child.* LV: (Mar. 1938), 455.

——— "Basal Metabolism of Undernourished Girls." *Am. Jr. Dis. Child.* LVI: (July 1938), 61.

Todd, T. W., Wharton, R. E., and Todd, A. W. "The Effect of Thyroid Deficiency upon Bodily Growth and Skeletal Maturation in the Sheep." *Am. Jr. Anatomy.* LXIII: (July 1938), 37.

Wagner, I. F. "The Body Jerk of the Neonate." *Ped. Sem. & Jr. Genet. Psychol.* LII: (Mar. 1938), 65.

Weiner, J. S. "An Experimental Study of Heat Collapse." *Jr. Indust. Hyg. & Toxicol.* XX: (June 1938), 389.

Welsh, J. H. "Diurnal Rhythms." *Quar. Rev. of Biol.* XIII: (June 1938), 123.

Whillis, J. *Elementary Anatomy and Physiology.* (Philadelphia: Lea & Febiger, 1938), 342 pp. $3.50.

Winslow, C.-E. A., Herrington, L. P., and Gagge, A. P. "Physiological Reactions and Sensation of Pleasantness Under Varying Atmospheric Conditions." *Heating, Piping, & Air Conditioning.* X: (Jan. 1938), 69.

——— "The Reactions of the Clothed Human Body to Variations in Atmospheric Humidity." *Am. Jr. Physiol.* CXXIV: (Dec. 1938), 692.

Yannet, H., and Darrow, D. C. "The Effect of Growth on the Distribution of Water and Electrolytes in Brain, Liver, and Muscle." *Jr. Biol. Chem.* CXXIII: (Mar. 1938), 295.

Zoetbout, W. D. *Textbook of Physiol-*

ogy. (St. Louis: Mosby, 1938), 714 pp. $4.75.

PHYSIOLOGY OF EXERCISE

Asmussen, E. "On Indisposition after Running." *Jr. Phys. Ed. & School Hyg.* XXX: (July 1938), 132.

Bell, G. H., and Knox, J. A. C. "Recording of Pulse Rate During Exercise." *Jr. Physiol.* XCIII: (1938), 36.

Blair, H. A. "The Excitability of Frog Muscle with Particular Reference to its Latent Addition." *Jr. Gen'l Physiol.* XXI: (May 1938), 557.

Bohm, W. H. "How Champions Train." *Ath. Jr.* XVIII: (Jan. 1938), 22.

Boyle, R. W., and Scott, F. H. "Some Observations on the Effect of Exercise on the Blood, Lymph and Muscle in Its Relation to Muscle Soreness." *Am. Jr. Physiol.* CXXII: (June 1938), 569.

Burge, W. E., *et al.* "The Effect of Exercise, Fatigue, and Exhaustion on the Electrical Potential of the Brain Cortex and Threshold of the Knee Jerk." RES. QUAR. IX: (Oct. 1938), 45.

Eichelberger, L. "The Exchange of Salt and Water between Muscle and Blood." *Jr. Biol. Chem.* CXXII: (Jan. 1938), 323.

"Exercise in Relation to Growth, Diet, and Resistance to Infection: Experiments with White Rats." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 24.

Fenn, W. O. "Factors Affecting the Loss of Potassium from Stimulated Muscles." *Am. Jr. Physiol.* CXXIV: (Oct. 1938), 213.

——— Cobb, D. M., Manery, J. F., and Bloor, W. R. "Electrolyte Changes in Cat Muscle During Stimulation." *Am. Jr. Physiol.* CXXI: (Mar. 1938), 595.

Gesell, R., and White, F. "Recruitment of Muscular Activity and the Central Neurone After-Discharge of Hyperpnea." *Am. Jr. Physiol.* CXXII: (Apr. 1938), 48.

Haldi, J., Bachmann, G., Ensor, C., and Wynn, W. "Muscular Efficiency in Relation to Taking of Food and to Height of Respiratory Quotient Immediately Before Exercise." *Am. Jr. Physiol.* CXXI: (Jan. 1938), 123.

Hawke, W. A. "Elevated Temperatures in Childhood Due to Exercise." *Jr. Pediat.* XI: (July 1937), 64.

Irving, L. "Changes in Blood Flow through Brain and Muscles during Arrest of Breathing." *Am. Jr. Physiol.* CXXII: (Apr. 1938), 207.

Keys, A. "The Oxygen Saturation of the Venous Blood in Normal Human Subjects." *Am. Jr. Physiol.* CXXIV: (Oct. 1938), 13.

——— and Fridell, H. L. "Size and Stroke of the Heart in Young Men in Relation to Athletic Activity." *Science.* LXXXVIII: (Nov. 1938), 456.

Lipovetz, F. J. *Applied Physiology of Exercise.* (Minneapolis: Burgess, 1938), 292 pp. $3.25.

Maaske, C. A., Krasne, M. R., and Eyster, J. A. "Further Observations on the Potential Distribution in the Frog's Gastrocnemius Muscle During Activity." *Am. Jr. Physiol.* CXXI: (Jan. 1938), 250.

Maison, G. L., Orth, O. S., and Lemmer, K. "*p*H Changes in Rabbit and Human Striated Muscle Contraction." *Am. Jr. Physiol.* CXXI: (Feb. 1938), 311.

Morgulis, S., and Osheroff, W. "Mineral Composition of the Muscles of Rabbits on a Diet Producing Muscle Dystrophy." *Jr. Biol. Chem.* CXXIV: (Aug. 1938), 767.

"Physical Fitness and Endurance." RES. QUAR. IX: (Mar. 1938), 10.

Reed, D. B. "Exercise." *Hygeia.* XVI: (Apr. 1938), 320; (May 1938), 433; (June 1938), 531; (July 1938), 602; (Aug. 1938), 694; (Sept. 1938), 829; (Oct. 1938), 911; (Nov. 1938), 1006; (Dec. 1938), 1120.

Sacks, J. "Recovering from Muscular Activity and Its Bearing on Chemistry of Contraction." *Am. Jr. Physiol.* CXXII: (Apr. 1938), 215.

Schneider, E. C., and Collins, R. "Venous Pressure Responses to Exercise." *Am. Jr. Physiol.* CXXI: (Mar. 1938), 574.

Schultz, F. W., and Morse, M. "Factors Influencing the Concentrations of Serum Protein, Chloride and Total

Fixed Base of the Dog During Exercise." *Am. Jr. Physiol.* CXXI: (Jan. 1938), 293.

Simonson, E. "Investigations in the Physiology of Running." *Travail Humain.* V: (1937), 286.

Sklianskaia, R. A., Shakhnovich, C. E., Levina, A. E. and Zak, A. I. "Changes in the Composition of Blood During Mental and Light Physical Work." *Jr. Indust. Hyg. & Toxiol.* XX: (Feb. 1938), 169.

Steiman, S. E., and Pratt, F. H. "Localized Response of the Muscle Fiber to Excitation." *Am. Jr. Physiol.* CXXII: (Apr. 1938), 27.

Wilson, R. E. "Analysis of the Pulse Rate After Exercise and Forced Expiration as Found in the McCurdy-Larson Organic Efficiency Test." (Grad. Thesis, Springfield College, 1938), 101 pp.

PHYSIOTHERAPY, MASSAGE, INDIVIDUAL AND CORRECTIVE EXERCISE

Bierman, W. *The Medical Applications of the Short Wave Current.* (Baltimore: Wood, 1938), 379 pp. $5.00.

Bivings, L. "Making a Corrective Shoe." *Am. Jr. Dis. Child.* LVI: (Oct. 1938), 775.

Blauch, L. E. *Vocational Rehabilitation of the Physically Disabled.* (Washington, D.C.: Supt. of Documents, Staff Study No. 9), 101 pp. $0.15.

Burton, W. E. "X-Rays." *Hygeia.* XVI: (Feb. 1938), 109.

Carpenter, C. I. *A Practical Guide to Massage.* (Baltimore: Wood, 1937), 127 pp. $2.00.

Cramp, A. J. "Electric and Magnetic Cure-Alls." *Hygeia.* XVI: (May 1938), 439.

Gitelson, M. "Clinical Experience with Play Therapy." *Am. Jr. Orthopsychiat.* VIII: (1938), 466.

——— "Section on Play Therapy, 1938." *Am. Jr. Orthopsychiat.* VIII: (July 1938), 499.

Hadley, J. "Various Roles of Relaxation in Psychotherapeutics." *Jr. Gen'l Psychol.* XIX: (July 1938), 191.

Hawley, G. *Kinesiology of Corrective Exercise.* (Philadelphia: Lea & Febiger, 1937), 268 pp. $2.75.

Hemingway, A. "The Panting Response of Normal Unanesthetized Dogs to Measured Dosages of Diathermy Heat." *Am. Jr. Physiol.* CXXI: (Mar. 1938), 747.

Hunt, J., Ashcraft, K., and Johnson, G. B. "A Further Study of Recreational Therapy." RES. QUAR. IX: (Mar. 1938), 60.

Kovacs, R. *The 1938 Year Book of Physical Therapy.* (Chicago: Year Book Publishers, Inc., 1938), 486 pp. $2.50.

——— "The Role of Physical Therapy in the Treatment of Nervous and Mental Diseases." *Psychiatric Quar.* XII: (Jan. 1938), 123.

Lommen, O. "School Programs for the Handicapped." *Jr. Health & Phys. Ed.* IX: (June 1938), 350.

Parker, N. A. "Application of Physiological and Psychological Principles Underlying Specific Therapeutic Treatments." (Grad. Thesis, Springfield College, 1938), 77 pp.

Phillips, R. T. "Practical Physical Medicine for Chronic Arthritis." *New Eng. Jr. Med.* CCXVIII: (Apr. 14, 1938), 639.

Pohle, E. A. *Theoretical Principles of Roentgen Therapy.* (Philadelphia: Lea & Febiger, 1938), 271 pp. $4.50.

Prosser, E. M. *Manual of Massage and Movements.* (London: Faber, 1938), 331 pp. 12s 6d.

Ramsay, G. A., and Johnston, R. A. "Muscle Conservation and Re-education in Post-Poliomyelitis Paralysis." *Can. Pub. Health Jr.* XXIX: (Apr. 1938), 158.

Stolinsky, A. "Some Facts and Comments on Physical Therapy." *Journal-Lancet.*, LVIII: (Jan. 1938), 22.

Togna, T. R. *Exercises in the Bath.* (Toronto: McClelland, 1938), 124 pp. $1.75.

Vulliamy, V. "Physical Education of Backward Children." *Ment. Welfare.* XVIII: (Jan. 1938), 14.

Waddington, J. E. *Physical Therapy, Theoretical and Clinical.* (St. Paul: Bruce, 1938), 489 pp. $5.50.

PLAY, RECREATION, LEISURE

Abbott, J. *Fun's Fun.* (Chicago: Rielly & Lee, 1938), 221 pp. $1.50.

Altaraz, I. M. "Recreation as a Factor in Handling Maladjusted Individuals." *Ment. Hyg.* XXII: (Apr. 1938), 276.

"Amusement Industry." *Recreation.* XXXI: (Feb. 1938), 639.

Bahr, F. "Adult Recreation." *Recreation.* XXXI: (Jan. 1938), 613.

Briggs, E. S. "How Adults in Missouri Use Their Leisure Time." *Sch. & Soc'y.* XLVII: (June 18, 1938), 805.

Brown, V. K. "Engineering—Material and Human." *Recreation.* XXXI: (Jan. 1938), 601.

——— "How Many Are Served?" *Recreation.* XXXII: (Nov. 1938), 457.

Chicago Recreation Survey. (Chicago: Chicago Recreation Commission and Northwestern University, 1937-38), 268 pp., 167 pp. 2 Vols., $1.00 ea.

Courter, C. V. "Education for Leisure." *Leisure.* V: (May 1938), 31.

Deering, T. "Municipal Golf Makes 'Hole in One.'" *Recreation.* XXXII: (Aug. 1938), 286.

DeVries, J. "Preparing for Play." *Nation's Schls.* XXI: (Mar. 1938), 49.

England, F. W. "Social Leisure Not Intramural Athletics." *Ath. Jr.* XIX: (Oct. 1938), 32.

Frank, G. "Citizen Leadership in Today's Leisure Time." *Recreation.* XXXI: (Feb. 1938), 635.

Fries, M. E. "The Value of Play for a Child Development Study." *Understanding the Child.* VII: (June 1938), 15.

Gloss, G. M. "What People Do in Their Spare Time." RES. QUAR. IX: (May 1938), 138.

Griffiiths, A. E. "A Guide to the Use of Adult Leisure Time." *Recreation.* XXXI: (Jan. 1938), 617.

"Hell Week for the Race Committee." *Country Life & Sportsman.* LXXIV: (Aug. 1938), 61.

Hjelte, G. "Coordination of Recreation Agencies." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 403.

Keppel, F. P. "Preparation for Leisure." *Jr. Adult Ed.* X: (Jan. 1938), 23.

Lambert, C. "Play for the Modern Child." *Child Study.* XV: (Apr. 1938), 195.

——— "Through the Looking Glass of Play." *Childhood Ed.* XV: (Oct. 1938), 60.

Lerch, J. "Consider the Chessmen." *Country Life & Sportsman.* LXXIII: (Mar. 1938), 64.

Lloyd, F. S. "The Administrator and Recreation." *Jr. Health & Phys. Ed.* IX: (June 1938), 339.

Low, H. R. "How Children Learn to Play at Different Levels." *Understanding the Child.* VII: (June 1938), 11.

Lynd, R. "Of Human Pleasures. *Living Age.* CCCLIV: (July 1938), 446.

Mack, H. "Recreational Therapy." *Am. Jr. Nursing.* XXXVIII: (May 1938), 526.

Learning in Leisure, the What and Why of Adult Education. (Minneapolis, Dept. of Education, Materials Project, 1938), 85 pp. $0.25.

Nash, J. B. "And Now Leisure." *Leisure.* V: (Jan. 1938), 33.

Nordly, C. "The Athletic Coach in the Community Recreation Program." *Ath. Jr.* XVIII: (June 1938), 27.

Norton, G. L. "Indoor Recreation 'According to Hoyle.'" *Recreation.* XXXII: (Nov. 1938), 445.

Oxley, H. W. *CCC Camp Education: Guidance and Recreational Phases.* (Washington, D.C.: U.S. Off. Educ. Bull., 1937, No. 19), 23 pp.

Pangburn, W. W. "Recreation to the Fore in American Cities." *Natn'l Munic. Rev.* XXVII: (Sept. 1938), 445.

Polson, R. A. "Problems in the Promotion and Organization of Recreation in the Rural Areas." *Proc. Nat'l Ed. Ass'n.* (1938), 167.

Powell, W. T. (Editor) *Recreation in Church and Community.* (New York: Abbington Press, 1938), 136 pp. $0.75.

Randall, J. D. "A Recreation Museum for Juniors." *Recreation.* XXXII: (Apr. 1938), 27.

"Recent Trends in Local Governmental Control of Year-Round Recreation." *Recreation.* XXXI: (Jan. 1938), 615.

Rogers, J. E. "Recreation in a Chang-

ing World." *Amer. City*. LIII: (Oct. 1938), 63.
"Science and Recreation." *Recreation*. XXXII: (Aug. 1938), 302.
Scott, H. A. "The School as a Coordinating Agency for Leisure-Time Activities." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 481; *Proc. Nat'l Ed. Ass'n* (1938), 172.
Smith, F. H. "Recreation in the Southern Highlands." *Recreation*. XXXII: (Apr. 1938), 13.
Smith, J. I., and Durfey, F. "Gentlemen's Chimney Pieces." *Country Life & Sportsman*. LXXIII: (Mar. 1938), 56.
Smith, M. G. "The Development of Corecreational Activities." *Proc. Nat'l Ed. Ass'n*. (1938), 173.
Steiner, J. F. *Recreation in the Depression*. (New York: Social Science Research Council, 1937), 124 pp. $1.00.
Stone, W. L. "The Job of Recreation." *Leisure*. V: (July 1938), 34.
"Study of Play Accidents in Pittsburgh." *Recreation*. XXXI: (Apr. 1938), 8.
Sykes, E. "The Play Teacher." *Am. Jr. Nursing*. XXXVIII: (Jan. 1938), 37.
"Tables of Playground and Community Recreation Statistics for 1937." *Recreation*. XXXII: (June 1938), 137.
Varga, H. E. "Public Recreation in Cleveland." *Recreation*. XXXII: (Sept. 1938), 333.
West, W. D. "Group Games—A Psychological Appraisal." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 217.
"What Shall I Do with My Leisure?" *Leisure*. V: (Feb. 1938), 36.
"Where They Garden for Fun!" *Recreation*. XXXI: (Mar. 1938), 720.
Wood, R. H. "Recreation Leadership as a College Course." *Jr. Health & Phys. Ed.* IX: (Feb. 1938), 99.
Woodward, H. M. "Recreation—A Philosophy of Joyful Living." *Recreation*. XXXI: (Jan. 1938), 587.
Worman, E. C. "Trends in Public Recreation." *Recreation*. XXXII: (Aug. 1938), 267.

Activities, Games, etc.

Alcox, M. "I Paint Paper Plates." *Leisure*. V: (Feb. 1938), 25.
Boettiger, E. F. *Children's Play Indoors and Out*. (New York: Dutton, 1938), 189 pp. $2.00.
Bloom, P. "Knot After Knot." *Leisure*. V: (May 1938), 11.
Bonyman, C. W. "Baskets of Wood." *Leisure*. V; (Oct. 1938), 24.
Burdette, F. L. "That Amazing Golf." *Recreation*. XXXII: (Dec. 1938), 507.
Campbell, C. C. "Let's Go Walking." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 476.
Combs, F. S. "A Progressive Game Kit." *Recreation*. XXXI: (Feb. 1938), 651.
Darbyshire, M. B. "The Plain Art of Chiseling." *Country Life & Sportsman*. LXXV: (Nov. 1938), 65.
Depew, A. M. *Cokesbury Game Book*. (Nashville, Tenn.: Cokesbury Press, 1938), 411 pp. $1.75.
Dobbs, E. V. *First Steps in Weaving*. (New York: Macmillan, 1938), 85 pp. $1.00.
Fisher, D. C., and Scott, S. F. *On a Rainy Day*. (New York: Barnes, 1938), 48 pp. $1.00.
Games for Boys and Men. (New York: National Recreation Association, 1938), 110 pp. $0.50.
Foster, M. "Music as a Playground Activity." *Recreation*. XXXII: (May 1938), 100.
Giaque, C. D., Porter, R. W., and Edgren, H. D. *Recreation in Church and Community*. (Cincinnati: Abingdon Press, 1938), 136 pp. $0.75.
Gleason, G. *Church Group Activities for Young Married People*. (Los Angeles, Cal.: G. Gleason, 715 S. Hope St., 1937), 161 pp. $1.00.
Hall, A. N. *Outdoor Handicraft for Boys*. (Philadelphia: Lippincott, 1938), 289 pp. $2.00.
Hammond, B., and Schriver, A. C. *Recreational Games and Sports Guide: Badminton, Track, and Field*. (New York: Barnes, 1938), 99 pp. $0.25.
Hoben, A. M. *The Beginner's Puppet Book*. (New York: Noble & Noble, 1938), 150 pp. $2.00.
Hoffman, A. C. "The Numbers Game." *Leisure*. V: (Sept. 1938), 39.
Kaye, N. *All About Parties*. (New York:

Crown Publishers, 1938), 326 pp. $1.00.

Kelley, E. M. "The Collector Exhibits." *Leisure*. V: (Sept. 1938), 10.

—— "Cup That Cheers." *Leisure*. V: (Apr. 1938), 26.

Lawson, A. *Fun in the Backyard*. (New York: Crowell, 1938), 208 pp. $2.00.

"Magic Numbers." *Leisure*. V: (Oct. 1938), 40.

Mason, B. S. "Drums, Tom-Toms and Rattles." (New York: Barnes, 1938), 206 pp. $2.50.

Menges, K. A. "An English May Festival." *Jr. Health & Phys. Ed*. IX: (Mar. 1938), 136.

Miller, M. K. "Archery in the Recreational Program." *Recreation*. XXXII: (July 1938), 229.

Milligan, D. F. *First Puppetry*. (New York: Barnes, 1938), 130 pp. $1.50.

Mills, W. H., and Dunn, L. M. *Shadow Plays and How to Produce Them*. (New York: Doubleday, Doran, 1938), 207 pp. $2.00.

"More Games Please!" *Recreation*. XXXII: (Sept. 1938), 343.

Nikolais, A. *Index to Puppetry*. (Hartford, Conn.: Hartford Park Dept.), (Pamphlet) $0.50.

Owen, E. *The Abingdon Party Book*. (Cincinnati: Abingdon Press, 1937), 366 pp. $1.00.

Perkins, F. "Dried Weed Arrangements in Winter Appease that Longing for Spring." *Leisure*. V: (Feb. 1938), 30.

"Playground Circus Days." *Recreation*. XXXII: (Aug. 1938), 274.

Powell, W. T. *Recreation in Church and Community*. (New York: Abingdon Press, 1938), 136 pp. $0.75.

"Refurbishing the Playground Program." *Recreation*. XXXII: (May 1938), 87.

Reynolds, H. A. *Complete Books of Modern Crafts*. (New York: Greenberg, 1938), 305 pp. $2.50.

Rugg, H., and Krueger, L. *Man at Work: His Arts and Crafts*. (New York: Ginn, 1938), 583 pp. $1.28.

Schrader, C. L. "Carnival Customs and Frolic." *Jr. Health & Phys. Ed*. IX: (Apr. 1938), 214.

Smith, L. B. "Building in Leisure Hours." *Progress. Ed*. XV: (Feb. 1938), 156.

Stahl, L. "Pointers on Puppetry." *Leisure*. V: (Jan. 1938), 36.

Sullenger, T. E. "Extracurricular Leisure-Time Activities." *Recreation*. XXXII: (Dec. 1938), 509.

Thornber, G. "Boddle Ball." *Jr. Health & Phys. Ed*. IX: (Sept. 1938), 436.

Walworth, R. L. *Shellcraft*. (Ft. Meyers, Fla.: Geddes Press, 1938, pamphlet), $0.60.

Wiggins, B. E. "Speedball Junior." *Jr. Health & Phys. Ed*. IX: (Sept. 1938), 440.

Wild, H. F. 'Loop Tennis." *Leisure*. V: (June 1938), 7.

Wittich, W. A. "Tetherball." *Leisure*. V: (Apr. 1938), 13.

Year Book—Park and Recreation Progress, 1937. (Washington, D.C.: Nat'l Park Service, U. S. Dept. Interior), $0.25.

"You Asked for It!" (Treasure Hunt). *Recreation*. XXXII: (Nov. 1938), 470.

Zimmerman, H. E. "Novel Method of Leaf Printing." *Leisure*. V: (Jan. 1938), 29.

"A Mirth Provoking Stunt." *Leisure*. V: (Oct. 1938), 41.

Equipment, Facilities, etc.

Allen, F. E. "Gardens for Recreation." *Recreation*. XXXII: (Apr. 1938), 33.

Brunner, E. D. S. "The School as a Recreational Center for Rural Areas." *Proc. Nat'l Ed. Ass'n*. (1938), 167.

Butler, G. D. *The New Play Areas*. (New York: Barnes, 1938), 242 pp. $3.00.

Carpenter, D. "Home Recreation." *Recreation*. XXXII: (Nov. 1938), 459.

Curtiss, H. L. "Opportunities for Recreation in the National Forests." *Recreation*. XXXI: (Jan. 1938), 591.

Dawson, P. "Organizing Recreation to Attract All Tastes." *Amer. City*. LIII: (June 1938), 40.

English, C. H. "A Playground Goes to the Children." *Recreation*. XXXII: (May 1938), 59.

Good, A. H. *Park and Recreational Structures*. Vol. I. "Administrative

and Basic Service Facilities," 200 pp. Vol. II. "Recreational and Cultural Facilities," 212 pp. Vol. III. "Overnight and Organized Camp Facilities," 112 pp. (Washington: Gov't Prtg. Off., Supt. Documents, 1938), $2.25 (entire set).

Juel, J. H. "Small Town Homemade Recreation." *Leisure.* V: (Feb. 1938), 12.

Kawin, E. *The Wise Choice of Toys.* (Chicago: Univ. of Chicago Press, 1938), 154 pp. $1.50.

Kellogg, H. L. "Parks, Playgrounds and Recreation." *Beach & Pool.* XII: (Jan. 1938), 26.

Loomis, C. F. "Learning in a Garden." *Recreation.* XXXI: (Mar. 1938), 696.

"Minimum Standards for Recreation Facilities." *Recreation.* XXXII: (July 1938), 241.

Mullaney, R. "Play Streets." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 434.

Richardson, H. "The Provision and Maintenance of Elementary School Playing Fields in Rural Areas." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (July 1938), 107.

Rogers, G. W. "Developing a Recreation Area through Federal Cooperation." *Recreation.* XXXII: (Apr. 1938), 31.

White, T. L. "Physical Education Demands Planned Play Areas." *Am. Sch. Board Jr.,* XCVI: (Apr. 1938), 28.

"Youth Hostels and Playgrounds in Belgium." *Sch. & Soc'y.* XLVII: (Feb. 12, 1938), 218.

POSTURE

Anderson, C. L. "The Gravity Method for Correction of Posture Disorders." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 429.

Bigelow, M. D. "The Variations and Interrelations of the Last Lumbar Vertebra and Sacrum." RES. QUAR. IX: (May 1938), 15.

"Factors in Anteroposterior Posture." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 89.

"Feet." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 103.

"Grading Anteroposterior Standing Posture." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 79.

Grigoroff, D. S. "Normative Study of the Posture of Springfield College Freshmen of 1937–38." (Grad. Thesis, Springfield College, 1938), 72 pp.

Habbe, S. "Normal Abnormalities." *Hygeia.* XVI: (Sept. 1938), 782.

Hellebrandt, F. A. "Standing as a Geotropic Reflex." *Am. Jr. Physiol.* CXXI: (Feb. 1938), 471.

Hitchcock, F. A., and Ferguson, J. K. W. "Respiratory and Circulatory Adjustments to the Erect Posture." *Am. Jr. Physiol.* CXXIV: (Nov. 1938), 457.

"Lateral Curvatures of the Spine." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 99.

"Lower Back." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 108.

McCloy, C. H. "X-ray Studies of Innate Differences in Straight and Curved Spines." RES. QUAR. IX: (May 1938), 50.

"Postural Relations in Walking." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 97.

"Problems Related to Motor Ability." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 57.

Roth, G. M., Williams, M. M. D., and Sheard, C. "Changes in the Skin Temperatures of the Extremities Produced by Changes in Posture." *Am. Jr. Physiol.* CXXIV: (Oct. 1938), 161.

Seashore, H. G., and Koch, G. "Postural Steadiness under Conditions of Muscular Tension and Fatigue." *Psychol. Rec.* II: (1938), 319.

Tepper, R. H., and Hellebrandt, F. A. "The Influence of the Upright Posture on the Metabolic Rate." *Am. Jr. Physiol.* CXXII: (June 1938), 563.

PROGRAMS, CURRICULA, SYLLABI, ETC.

"Arts and Crafts for Playgrounds." *Recreation.* XXXII: (May 1938), 63.

Ayer, F. C. "The Social Studies in the Changing Curriculum." *Education.* LVIII: (Mar. 1938), 397.

Baker, G. M., Warnock, F. M., and Christensen, G. D. *Graded Lessons in Fundamentals of Physical Education —A Program for Grades One to Six.* (New York: Barnes, 1938), 367 pp. $3.00.

Bartlet, F. L. *Junior Athletics: for Elementary Schools.* (Toronto: Clarke, Irwin, 1938), 167 pp. $1.00.

Bell, M. *Curriculum Problems in Physical Education, School Health, and Recreation.* (Ann Arbor, Mich.: Bureau of Educational Reference and Research, Univ. of Michigan, 1938), 58 pp. $1.00.

Broady, L. P. *Health and Physical Education for Small Schools.* (Lincoln: Neb.: Univ. of Nebraska Teachers College, Univ. Ext. Div., 1937), 192 pp. $1.75.

"Building the Health Curriculum in the High School." *Hygeia.* XVI: (Feb. 1938), 163; (Mar. 1938), 255; (Apr. 1938), 357; (May 1938), 453; (June 1938), 551; (July 1938), 644; (Aug. 1938), 752.

Cassidy, R. "Recent Studies of American Adolescents as Guides for the Reorganization of the Secondary School Physical Education Program." Res. Quar. IX: (Dec. 1938), 38.

Christenson, A. "An Intramural Sports Program for Colleges and High Schools." *Ath. Jr.* XVIII: (June 1938), 38.

"Courses in Physical Education at the University of Minnesota." *Sch. & Soc'y.* XLVII: (Feb. 19, 1938), 237.

Evans, E. E. "Winfield Summer Activity Program." *Clearing House.* XIII: (Dec. 1938), 200.

Fash, B. "A Physical Education Program." *Am. Jr. Nursing.* XXXVIII: (Mar. 1938), 264.

Garrison, J. R. "A Year's Publicity Program." *Jr. Health & Phys. Ed.* IX: (June 1938), 361.

Huelster, L. J. "Amateur Motion Picture Projects." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 494.

Jones, H. A. "The New York State Athletic Program." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 26.

Kent, E. "Curriculum Adjustments for Small Rural Schools." *Proc. Nat'l Ed. Ass'n.* (1938), 497.

LaPorte, W. R. *The Physical Education Curriculum: A National Program.* (College Physical Education Assn., Univ. of S. California, 1937), 86 pp. $1.00.

Linder, L. H. "Twelve Basic Questions on Curriculum Construction." *Am. Sch. Board Jr.* XCVI: (Mar. 1938), 27.

Marsh, C. C. "Enlarging the Arts and Crafts Program." *Recreation.* XXXII: (May 1938), 97.

Mettel, H. B., and Westfall, M. H. "Indiana's Dental Health Program." *Am. Jr. Public Health.* XXVIII: (Aug. 1938), 949.

Miles, C. M. *Play and Recreation for Children and Adults; An Educational Program for More Satisfactory Living.* (New York State Univ., 1938), 116 pp. $0.25.

Nash, C. A. "Arranging the Intramural Program in a Rural High School." *Ath. Jr.* XVIII: (May 1938), 40.

Nature Program on a Playground." *Recreation.* XXXII: (May 1938), 68.

Nyswander, D. B. "Experimental Ventures in a School Health Program." *Proc. Nat'l Ed. Ass'n.* (1938), 158.

Pegg, D. A. "The Physical Education of the Blind and the Deaf." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Nov. 1938), 187.

Peters, D. W. "A State Program of Curriculum Development and the Rural Schools." *Proc. Nat'l Ed. Ass'n.* (1938), 490.

Phair, J. T. "A More Effective School Health Program." *Am. Jr. Pub. Health.* XXVIII: (Sept. 1938), 1059.

Pistov, F. "Spotlighting Activity Programs." *Childhood Ed.* XV: (Nov. 1938), 122; (Feb. 1939), 272.

"Prescriptions for Hallowe'en Hoodlums." *Recreation.* XXXII: (Oct. 1938), 385.

"Program Helps for May Day–Child Health Day." *Am. Jr. Nursing.* XXXVIII: (Apr. 1937), 504.

Rogers, D. C. "Planning School-Building Construction Programs." *Am. School Board Jr.* XCVI: (Jan. 1938), 52.

Sandison, M. "Toward a Nation-wide Program for Medical Care." *Jr. Nat'l Ed. Ass'n.* XXVII: (Oct. 1938), 215.

Spicer, D. G. *The Book of Festivals.* (New York: The Womans Press, 1937), 429 pp. $3.00.

Stanford, M. A. "A School Health Program." *Am. Jr. Nursing.* XXXVIII: (May 1938), 553.

Stone, H. W. "Development of a School Building Program." *Progress. Ed.* XV: (Apr. 1938), 320.

Swan, L. A., Jackson, C. H., and Williams, N. R. "Badminton in the Schools." *Jr. Health & Phys. Ed.* IX: (Mar. 1938), 148.

Wickey, R. "Using Accident Facts in Curriculum Building." *Safety Ed.* XVII: (Dec. 1937), 93.

Wisan, J. M. "Evaluation of Dental Programs for Children." *Am. Jr. Pub. Health.* XXVIII: (July 1938), 859.

Winslow, C.-E. A. *The School Health Program.* (New York: McGraw-Hill, 1938), 120 pp. $1.50.

RELATIONSHIPS

Artistic, Educational, Mental, Physical, Social, etc.

Barmack, J. E. "Boredom and Other Factors in the Physiology of Mental Effort." *Archiv. Psychol.* No. 218. (1937), 83 pp. $1.25.

Bock, T. M. "Relation of Dance to Other Space Arts." *Educ. Dance.* I: (Dec. 1938), 5.

Burks, F. W. "Some Factors Related to Social Success in College." *Jr. Soc. Psychol.* IX: (May 1938), 125.

Cabot, P. S. deQ. "The Relationship between Characteristics of Personality and Physique in Adolescents. *Genet. Psychol. Monographs.* XX: (Feb. 1938), 3. (Provincetown, Mass.: The Journal Press, 1938), 120 pp. $1.50.

Clague, E. "Interrelationship of Health and Welfare Records and Statistics." *Am. Jr. Pub. Health.* XXVIII: (May 1938), 599.

Collins, S. D., and Tibbets, C. *Social Aspects of Health in the Depression.* (New York: Social Science Research Council, 1937), 134 pp. $1.00.

Crampton, C. W. and Partridge, E. D. "Social Adjustments Associated with Individual Differences among Adolescent Boys." *Jr. Ed. Sociol.* XII: (Oct. 1938), 66.

Douglas, C. M. "The Teeth in Relation to Mental Diseases." *Jr. Am. Dental Ass'n.* XXV: (Aug. 1938), 1260.

Dunbar, H. F. *Emotions and Bodily Changes.* (New York: Columbia Univ. Press, 1935), 595 pp. $5.00.

"Exercise in Relation to Growth, Diet, and Resistance to Infection: Experiments with White Rats." RES QUAR. IX: (Wellesley College Supplement, Mar. 1938), 24.

Folks, H. "The Case of Public Health vs. Public Welfare." *Am. Jr. Pub. Health.* XXVIII: (Aug. 1938), 907.

Forrester-Brown, M. "The Medical Aspects of Physical Training." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Nov. 1938), 177.

Freeman, G. L. "Our Muscles and Our Minds." *Sci. Mon.,* XLVII: (1938), 161.

Gibson, J. M. "Rats and Health." *Hygeia.* XVI: (Dec. 1938), 1110.

Haggard, H. W. *Man and His Body.* (New York: Harpers, 1938), 594 pp. $4.00.

Harrington, M. *A Biological Approach to the Problem of Abnormal Behavior.* (Lancaster, Pa.: Science Press Printing Co., 1938), 459 pp. $4.00.

Honzik, M. P., and Jones, H. E. "Mental-Physical Relationships During the Pre-School Period." *Jr. Exp. Ed.* VI: (Dec. 1937), 139.

Hooton, E. A. *Crime and the Man.* (Cambridge, Mass.: Harvard Univ. Press, 1939), 403 pp. $3.75.

Husband, R. W. "Body Build and Personality Traits in College Students." *Jr. Gen'l Psychol.* XVIII: (Jan. 1938), 199.

Irwin, L. W. "A Study of the Relationship of Dominance to the Performance of Physical Education Activities." RES. QUAR. IX: (May 1938), 98.

Jaarsma, C. "Comparative Philosophies of Education." *Education.* LVIII: (June 1938), 630.

Jack, B. "Integrating a Camp Program

with Family Case Work." *Family.* XIX: (June 1938), 111.

Keliher, A. V. *Life and Growth.* (New York: Appleton-Century, 1938), 245 pp. $1.20.

Kenney, F. M. "A Character Education Experiment." *Chicago School Jr.* XIX: (Jan.-Feb. 1938), 109.

Kirschner, M. "Physical Awareness and Control." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (July 1938), 94.

Kohn, H. A. "Achievement and Intelligence Examinations Correlated with Each Other and with Teacher's Rankings." *Ped. Sem. & Jr. Genet. Psychol.* LII: (June 1938), 433.

Lindsay, K. "Physical Fitness and the Child." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Mar. 1938), 12.

Lloyd, F. S. "Liberal Cultural Values of Physical Education." *Jr. Health & Phs Ed.* IX: (Feb. 1938), 69.

Lunt, L. K. "Attitudes in Relation to Illness." *New Eng. Jr. Med.* CCXIX: (Oct. 13, 1938), 557.

Madden, M. "Recreation Looks at Physical Education." *Jr. Health & Phys. Ed.* IX: (June 1938), 358.

Marsh, L. C., Fleming G., and Blackler, C. F. *Health and Unemployment.* (New York: Oxford Univ. Press, 1938), 243 pp. $3.00.

McGehee, W. "Freshman Grades and the American Council Psychological Examinations." *Sch. & Soc'y.* XLVII: (Feb. 12, 1938), 222.

Miles, C. C. "Intelligence and Social Adjustment." *Ment. Hyg.* XXII: (Oct. 1938), 544.

Morgan, J. J. B., and Banker, M. H. "The Relation of Mental Stamina to Parental Protection." *Ped. Sem. & Jr. Genet. Psychol.* LII: (June 1938), 347.

Moulton, H. G. "Science and Society." *Science.* LXXXVII: (Feb. 25, 1938), 173.

"Movement in Representative Art." Res. Quar. IX: (Wellesley College Supplement, Mar. 1938), 120.

Parran, T. "Relationship of Maternal and Child Health to the General Health Program." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 256.

"Physical Fitness and Endurance." Res. Quar. IX: (Wellesley College Supplement, Mar. 1938), 10.

Pullias, E. V. "The Relationship Between Education and Mental Hygiene." *Ment. Hyg.* XXII: (Oct. 1938), 612.

Redcay, E. E. "The Coach and the Faculty." *Sch. & Soc'y.* XLVII: (May 28, 1938), 699.

"Relation of Intercollegiate Athletics to the Public." *Proc. Nat'l Coll. Ath. Ass'n.* (Dec. 1938), 69.

Rickey, W. B. "The Amateur and the Professional." *Ath. Jr.* XVIII: (Apr. 1938), 12.

Robinson, B. B. "The Professional in Recreation and His Responsibility for Personality Development." *Recreation.* XXXII: (Sept. 1938), 323.

Rogers, J. E. "Education Through Physical Education." *Education.* LVIII: (Mar. 1938), 441.

Roper, R. E. "Physical Education and Its Contribution to Mental Health." *Ment. Hyg.* IV: (April 1938), 61.

Searl, M. N. "A Note on the Relation between Physical and Psychic Differences between Boys and Girls." *Intn'l Jr. Psycho-Analysis.* XIX: (Jan. 1938), 50.

Sherman, H. C. "Relation of Nutrition to Optimal Health." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 406.

Simpson, C. *Photography of the Figure in Color and Monochrome.* (Boston: Amer. Photo Pub. Co., 1938), 208 pp. $5.00.

Smith, H. N., and Coops, H. L. *Physical and Health Education.* (New York: American Book Co., 1938), 323 pp. $2.25.

Sparrow, C. A. "Social Security and the Physician." *New Eng. Jr. Med.* CCXVIII: (Feb. 3, 1938), 225.

Strouse, S. "Weather and the Human Body." *Hygeia.* XVI: (Aug. 1938), 704.

Swann, W. F. G. "Science and Human Happiness." *Jr. Adult Ed.* X: (Apr. 1938), 117.

Todd, T. W. "Aging Versus Infirmity." *Sci. Month.* (June 1938), 545.

Todd, M. E. *The Thinking Body.* (New York: Harper, 1937), 314 pp. $4.00.

Toops, H. A., and Haven, S. E. *Psy-*

chology and the Motorist. (Columbus, Ohio: Adams, 1938), 265 pp. $2.00.

Tousant, E. S. "Relation of the Physician to Industry." *New Eng. Jr. Med.* CCXVIII: (June 30, 1938), 1087.

Trilling, B. M. "The Significance of Physical Education in Modern Life." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 3.

Watson, G. "Personality Growth Through Athletics." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 408.

Weber, E. W. "A Study of the Correlation of Fatigability, Mental Ability and Scholarship among High School Football Players." *Ath. Jr.* XIX: (Nov. 1938), 22.

Williams, J. F. "Physique and Health." *Am. Jr. Pub. Health.* XXVIII: (Apr. 1938), 487.

Wolf, S. J. "Historic Background of the Study of Personality as it Relates to Success or Failure in Academic Achievement." *Jr. Gen. Psych.* XIX: (Oct. 1938), 417.

Worthingham, C. A. "The Dance and Corrective Physical Education." *Ed. Dance.* I: (June-July 1938), 8.

TEACHER TRAINING, METHODS, PEDAGOGY

Allen, H. P. "Earmarks of a Good Teacher." *Am. Sch. Board Jr.* XCVI: (Mar. 1938), 25.

Bateman, E. A. "How Teacher Training May Be Improved." *Jr. Health & Phys. Ed.* IX: (June 1938), 346.

Bowers, H. J. "Ten Principles of Teacher Certification." *Am. Sch. Board Jr.* XCVI: (June 1938), 41.

Briggs, E. S. "Evaluation of Extracurricular Activities by Teachers College Students." *Sch. & Soc'y.* XLVIII: (Oct. 22, 1938), 539.

Brown, M. C. "A Rating Profile for Student Teachers and Teachers of Physical Education." RES. QUAR. IX: (Oct. 1938), 73.

Clement, E. "Professional Teacher Education in Liberal Arts Colleges in California." *Education.* LVIII: (Mar. 1938), 419.

Cottrell, E. B. "Standards for the Selection of Persons to be Trained for Placement in Health and Physical Education." RES. QUAR. IX: (May 1938), 63.

DeLong, V. R. "Establishing a Guidance Program." *Am. Sch. Board Jr.* XCVI: (June 1938), 49.

Donovan, H. L. "What is the Essential Nature of a Teachers College Administrative Staff?" *Proc. Nat'l Ed. Ass'n.* (1938), 309.

Drew, G. C. "The Function of Punishment in Learning." *Ped. Sem. & Jr. Genet. Psychol.* LII: (June 1938), 257.

English, C. H. "A Training Course in Home Play." *Recreation.* XXXII: (July 1938), 211.

Evenden, E. S. "What is the Essential Nature of an Evolving Curriculum of a Teachers College?" *Proc. Nat'l Ed. Ass'n.* (1938), 285.

"Extensions to the Carnegie Physical Training College, Leeds." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Nov. 1938), 195.

Fit to Teach. (Washington, D.C.: 9th Yearbook, Dept. of Classroom Teachers of the Nat'l Ed. Ass'n, 1938), 276 pp.

Jackson, C. O. "Improving Student Teaching." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 512.

Lee, E. A. "Individual Guidance for Occupations and Health." *Am. Sch. Board Jr.* XCVII: (Sept. 1938), 27.

Lees, H. D., and Burke, E. M. "The Value of the Individual Health Record in Hygiene Teaching." *Journal-Lancet.* LVIII: (Aug. 1938), 378.

Manley, H. "Techniques of Teacher Supervision." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 486.

Oberteuffer, D. "Re-Evaluation of the Professional Curriculum." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 469.

Patry, F. L. "Teaching the Physically Handicapped Child." *Jr. Sch. Health.* VII: (May 1938), 128.

Pittenger, B. F. "Teacher Education and Training." *Ed'l Rec.* XIX: (Oct. 1938), 463.

"Problems Related to Administrative and Teaching Procedures in Hygiene and Physical Education." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 67.

Prosch, F. "Participation in Non-Required Activities by Physical Education Major Students." Res. Quar. IX: (Oct. 1938), 59.

"Qualifications of the Teacher." *Am. Sch. Board Jr.* XCVII: (Sept. 1938), 23.

Roberts, H. G. "Group Leader's Qualifications." *Leisure.* V: (Sept. 1938), 32.

Rugen, M. E. "Evaluating the Effectiveness of Supervision for Student Teachers." Res. Quar. IX: (Oct. 1938), 89.

Russell, J. D. "What Is the Essential Nature of a Teachers College Instructional Staff?" *Proc. Nat'l Ed. Ass'n.* (1938), 295.

Russell, J. E. "Can the Art of Teaching Be Taught?" *Jr. Adult Ed.* X: (Oct. 1938), 383.

Sharman, J. R. "Professional Education of Physical Education Teachers in Germany." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 10.

"Teacher-Certification Practices in the United States." *Am. Sch. Board Jr.* XCVII: (July 1938), 50.

"To What Extent Do We Educate for Social Action?" *Jr. Adult Ed.* X: (June 1938), 271.

Townes, M. E. *Teaching with Motion Pictures.* (New York: Bureau of Publications, Teachers College, Columbia Univ., 1938), 25 pp. $0.25.

Townsend, M. E. "The Essential Nature of a Teachers College Student Body." *Proc. Nat'l Ed. Ass'n.* (1938), 320.

"Training of Physical Education Leaders in England." *Sch. & Soc'y.* XLVIII: (Oct. 1, 1938), 422.

Valentine, A. "Teacher Training versus Teacher Education." *Edu'l Rec.* XIX: (July 1938), 332; (*Bull. Ass'n. Amer. Colleges.* XXIV: (Nov. 1938), 327.

Walke, N. S. *Traits Characteristic of Men Majoring in Physical Education at The Pennsylvania State College.* (Penn State College, Teachers College, 1937), 62 pp. $1.60.

Wallin, J. E. W. "Trends and Needs in the Training of Teachers for Special Classes for Handicapped Children." *Jr. Ed'l Res.* XXXI: (Mar. 1938), 506.

Zerler, M. L. "Correcting Speech Defects." *Am. Jr. Nursing.* XXXVIII: (April 1938), 433.

TESTS, INDICES, MEASUREMENTS, SCALES, STANDARDS, ANTHROPOMETRY

Adams, E. H. "A Comparative Anthropometric Study of Hard Labor During Youth as a Stimulator of Physical Growth of Young Colored Women." Res. Quar. IX: (Oct. 1938), 102.

Adrian, M. B. "Comparative Study of Steadiness of Athletes and Non-Athletes." (Grad. Thesis, Springfield College, 1938), 66 pp.

Assheton, R. *Growth in Length; Embryological Essays.* (New York: Macmillan, 1938), $1.25.

Beebee, F. S. "A Further Study of the Analysis of Movement on the Basis of Latent Times and Variabilities." Res. Quar. IX: (Mar. 1938), 10.

"Body Type and Weight Prediction." Res. Quar. IX: (Wellesley College Supplement, Mar. 1938), 115.

Bovard, J. F., and Cozens, F. W. *Tests and Measurements in Physical Education.* (2nd ed.; Philadelphia: Saunders, 1938), 427 pp. $3.00.

Buxton, C. "Application of Multiple Factorial Methods to the Study of Motor Abilities." *Psychometrika.* III: (1938), 85.

Campbell, M. "The Experimental Analysis of General Motor Ability." *Jr. Gen. Psychol.* XIX: (Oct. 1938), 401.

Carpenter, A. "A Study of Angles in the Measurement of the Leg Lift." Res. Quar. IX: (Oct. 1938), 70.

Dain, C. A. "Walking Beam Test of Dynamic Balance." (Grad. Thesis, Springfield College, 1938), 61 pp.

Dearborn, W. F., Rothney, J. W. M., and Shuttleworth, F. K. *Data on the Growth of Public School Children.* (Washington, D.C.: Society for Research in Child Development, National Research Council, 1938), 136 pp. $1.00.

Dyer, J. T. "Revision of the Backboard Test of Tennis Ability." Res. Quar. IX: (Mar. 1938), 25.

Elftman, H. "The Measurement of the External Force in Walking." *Science.* LXXXVIII: (Aug. 12, 1938), 152.

Fialkin, H. N., and Beckman, R. O. "The Influence of Month of Birth on the Intelligence Test Scores of Adults." *Ped. Sem. & Jr. Genet. Psychol.* LII: (Mar. 1938), 203.

Glassow, R. B., and Broer, M. R. "A Convenient Apparatus for the Study of Motion Picture Films." RES. QUAR. IX: (May 1938), 41.

——— *Measuring Achievement in Physical Education.* (Philadelphia: Saunders, 1938), 344 pp. $2.75.

Guilford, J. P. "Intelligence Tests." *Education.* LVIII: (May 1938), 526.

Hackensmith, C. W., and Miller, L. "A Comparison of the Academic Grades and Intelligence Scores of Participants and Nonparticipants in Intramural Athletics at the University of Kentucky." RES. QUAR. IX: (Mar. 1938), 94.

Hahn, M. L., and Winslow, C.-E. A. *Let's Grow.* (New York: Merrill, 1938), 186 pp. $0.72.

Hathaway, G. J., and Everts, E. W. "The Use of a Belt to Measure Leg Strength Improves the Administration of Physical Fitness Tests." RES. QUAR. IX: (Oct. 1938), 62.

Henry, F. M., and Kleeburger, F. L. "The Validity of the Pulse-Ratio Test of Cardiac Efficiency." RES. QUAR. IX: (Mar. 1938), 32.

Henry, F., and Farmer, D. "Functional Tests: II. The Reliability of the Pulse-Ratio Test." RES. QUAR. IX: (May 1938), 81.

Hutto, L. E. "Measurement of the Velocity Factor and of Athletic Power in High School Boys." RES. QUAR. IX: (Oct. 1938), 109.

Jones, H. E. "The California Adolescent Growth Study." *Jr. Ed. Res.* XXXI: (Apr. 1938), 561.

Johnson, F. A. "Improvement Rate of Homogeneous Groups of Seven Physical Education Activities." (Grad. Thesis, Springfield College, 1938), 194 pp.

Keeler, L. D. "The Effect of Maturation on Physical Skill as Measured by the Johnson Physical Skill Test. RES. QUAR. IX: (Oct. 1938), 54.

Kuscher, O., Jr. "McCurdy-Larson and Tuttle's Tests Applied to Convalescence and Normalcy." (Grad. Thesis, Springfield College, 1938), 105 pp.

Lee, J. M. "The Changing Curriculum Challenges Measurement." *Education.* LVIII: (May 1938), 531.

Lefever, D. W. "What Every Classroom Teacher Should Know About Testing." *Education.* LVIII: (May 1938), 520.

Lurie, W. A. "The Measurement of Prestige and Prestige-Suggestibility." *Jr. Soc. Psychol.* IX: (May 1938), 219.

McCaskill, C. L., and Wellman, B. L. "A Study of Common Motor Achievements at the Pre-school Ages." *Child Devel'p't.* IX: (1938), 141.

McCloy, C. H. *Appraising Physical Status: Methods and Norms.* (Iowa City: Univ. of Iowa, 1938), 260 pp. $1.50.

McElroy, H. N. "A Report on Some Experimentation with a Skill Test." RES. QUAR. IX: (Oct. 1938), 82.

Methany, E. "Studies of the Johnson Test as a Test of Motor Educability." RES. QUAR. IX: (Dec. 1938), 105.

Peatman, J. G., and Higgons, R. A. "Growth Norms from Birth to the Age of Five Years." *Am. Jr. Dis. Child.* LV: (June 1938), 1233.

Preston, M. G. "Psychophysical Measurement Methods." *Psychol. Bull.* XXXV: (Feb. 1938), 63.

Quaid, T. D. D. "A Study in the Prediction of College Freshmen Marks." *Jr. Exp. Ed.* VIII: (1938), 350.

Remmers, H. H., Whisler L., and Duwald, V. "Neurotic Indicators at the Adolescent Level." *Jr. Soc. Psychol.* IX: (Feb. 1938), 17.

Russell, N., and Lange, E. "Studies Relating to Achievement Scales in Physical Education Activities." RES. QUAR. IX: (Dec. 1938), 43.

Scates, D. E. "What Can Research Contribute to Our Understanding of the Physically Handicapped?" *Jr. Ed. Res.* XXXI: (Sept. 1938), 20.

Scott, M. G. "The Use of Skill Tests."

Jr. Health & Phys. Ed. IX: (June 1938), 364.

Sheeder, F. I. "College Achievement of Lower Group Secondary School Students." *Jr. Edu. Res.* XXXI: (Mar. 1938), 497.

Stibbe, E. P. *Introduction to Physical Anthropology.* (New York: Longmans, 1938), 230 pp. $2.35.

"Tests and Analysis of General Motor Ability." RES. QUAR. IX: (Wellesley College Supplement, Mar. 1938), 49.

Turner, C. E., and Nordstrom, A. "Extent and Seasonal Variations of Intermittency in Growth." *Am. Jr. Pub. Health.* XXVIII: (Apr. 1938), 499.

Tuttle, W. W., and Dickinson, R. E. "A Simplification of the Pulse-Ratio Technique for Rating Physical Efficiency and Present Condition." RES. QUAR. IX: (May 1938), 73.

Wendler, A. J. "A Critical Analysis of Test Elements Used in Physical Education." RES. QUAR. IX: (Mar. 1938), 64.

Wettstone, E. "Tests for Predicting Potential Ability in Gymnastics and Tumbling." RES. QUAR. IX: (Dec. 1938), 115.

Wild, M. R. "The Behavior Pattern of Throwing and Some Observations Concerning Its Course of Development in Children." RES. QUAR. IX: (Oct. 1938), 20.

VITAL STATISTICS

Baker, O. E. "Population Prospects and Public Schools." *Sch. Life.* XXIII: (May 1938), 302.

Baudry, Y. "The Circumstances of Accidental Death in Canada in 1936). *Can. Pub. Health Jr.* XXIX: (Mar. 1938), 127.

"Birth and Death Rates by States for 1936 and Prior Years." *Pub. Health Repts.* LIII: (Feb. 4, 1938), 168.

Blose, D. T. "Average Salary of Teachers, Supervisors, and Principals." *Sch. Life.* XXIII: (Mar. 1938), 254.

Clarke, E. H. "Birth Control and Prosperity." *Forum.* XCIX: (Feb. 1938), 107.

Coats, R. H. "Practical Achievements in Vital Statistics." *Can. Pub. Health Jr.* XXIX: (Nov. 1938), 527.

Currey, D. V. "Vital Statistics in the Public Health Program." *Can. Pub. Health Jr.* XXIX: (Apr. 1938), 171.

"Death Rates for the Most Important Causes of Death in 1936." *Pub. Health Repts.* LIII: (July 1, 1938), 1078.

Dorn, H. F. "Incidence and Future Expectancy of Mental Disease." *Pub. Health Repts.* LIII: (Nov. 11, 1938), 1991.

——— "Relative Amount of Ill Health in Rural and Urban Communities." *Pub. Health Repts.* LIII: (July 15, 1938), 1181.

Dunn, H. L. "Adaptation of the International List of Causes of Death to Changing Needs of the Medical Profession and Public Health Groups." *Am. Jr. Pub. Health.* XXVIII: (Mar. 1938), 283.

Eells, W. B. "Educational Research and Statistics: Status of the Junior College in the United States, 1937–38." *Sch. & Soc'y.* XLVII: (Jan. 29, 1938), 158.

Fairchild, H. P. "When the Population Levels Off." *Harper's.* CLXXVI: (May 1938), 596.

Farber, S. "Unexpected Death in Early Life." *New Eng. Jr. Med.* CCXIX: (Nov. 24, 1938), 836.

Gover, M. "Excess Mortality During Periods of Excessive Temperature." *Pub. Health Repts.* LIII: (July 8, 1938), 1122.

Heffernan, R. J. "The Maternal Mortality Study in Massachusetts for 1937." *New Eng. Jr. Med.* CCXIX: (Dec. 11, 1938), 865.

Herrington, L. P., and Moriyana, I. M. "The Relation of Mortality from Certain Metabolic Diseases to Climatic and Socio-Economic Factors." *Am. Jr. Hyg.* XXVIII: (Nov. 1938), 396.

Huntington, E. *Season of Birth.* (New York: Wiley, 1938), 473 pp. $3.50.

Magnitude of the Chronic Disease Problem in the United States. (Washington: National Health Survey, Preliminary Reports, Sickness and Medical Care Series, Bull. No. 6, U. S. Public Health Service, 1938), 19 pp.

McCleary, C. F. *Population: Today's*

Question. (New York: Macmillan, 1938), 222 pp. $2.10.

(Morbidity). *Science* LXXXVII; (Jan. 21, 1938, Supp.), 8.

"Mortality and Morbidity Trends During 1937 and Prior Years." *Pub. Health Repts.* LIII: (May 6, 1938), 701.

Peatman, J. G., and Higgons, R. A. "Growth Norms from Birth to the Age of Five Years." *Am. Jr. Dis. Child.* LV: (Dec. 1938), 1233.

Pequegnat, L. A. "The Present Problem in Infant Mortality." *Can. Public Health Jr.* XXIX: (Oct. 1938), 477.

Problems of a Changing Population. (Washington: U. S. Gov't Prtg. Office, Nat'l Resources Comm., 1938), 306 pp. $0.75.

Thompson, W. S. "Population Growth —Its Vital Statistics and Public Health Aspects." *Am. Jr. Pub. Health*. XXVIII: (Nov. 1938), 1319.

"Typhoid Death Rate." *Amer. City*. LIII: (Apr. 1938), 15.

Whelpton, P. K. *Needed Population Research*. (New York: The Science Press Printing Co., 1938), 196 pp. $1.00.

Yerushalmy, J. "Neonatal Mortality by Order of Birth and Age of Parents." *Am. Jr. Hyg.* XXVIII: (Sept. 1938), 244.

WINTER SPORTS

Chilcott, A. E. "Ski Gymnastics." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 34.

Cummings, D. *Figure Skating as a Hobby*. (New York: Harpers, 1938), 132 pp. $2.00.

Dutton, M. *Hockey (Fastest Game on Earth)*. (New York: Funk & Wagnalls, 1938), 196 pp. $2.00.

Gardiner, F. M. *Wings on Ice*. (New York: Yachting Pub. Co., 1938), 160 pp. $3.50.

Gore, H. M., and Briggs, L. E. *Skiing*. (New York: Boy Scouts of America, 1938), 74 pp. $0.20.

Hedges, S. G. "Fancy Skating." *Leisure*. V: (Jan. 1938), 13.

Heinrich, F. *Games to Play on Skiis*. (Brattleboro, Vt.: Daye, 1938), 37 pp. $0.50, pa.

Hertell, E. S. *Cue's Guide to Winter Sports*. (New York: Dodge, 1938), 96 pp. $1.00.

"How Best to Excel at Your Game: Hockey." *World Sports*. VI: (Dec. 1938), 48.

Lewis, F. *Modern Skating*. (Chicago: Reilly & Lee, 1938), 128 pp. $1.25.

Lund, C. C. "Skiing." *Hygeia*. XVI: (Jan. 1938), 29; (Feb. 1938), 145.

Meredith, B. *Escape on Skiis*. (New York: Dodge, 1938), 253 pp. $3.00.

——— "The Ski Fields Challenge." *Country Life*. LXXIII: (Dec. 1937), 82.

Moulton, W. E. S. "Fundamentals and Trick Plays in Hockey." *Ath. Jr.* XVIII: (Jan. 1938), 10.

——— "Play of the Goalkeeper in Ice Hockey." *Ath. Jr.* XVIII: (Feb. 1938), 20.

Reed, D. B. "Figure Skating." *Hygeia*. XVI: (Mar. 1938), 208.

Rourke, E. L. "Ski-Line Hostel." *Leisure*. V: (Dec. 1938), 18.

Rybizka, B. *The Hennes Schneider Ski Technique*. (New York: Harcourt Brace, 1938), 109 pp. $2.50.

Salvesan, C. E. *Foundation of Skating*. (Philadelphia: Saunders (agents) 1938), 48 pp. $0.85.

"Ski School at St. Cristoph." *Country Life & Sportsman*. LXXIII: (Jan. 1938), 40.

Smart, R. E., Jr. "A Study of Falls in Skiing." RES. QUAR. IX: (Dec. 1938), 97.

Starzyk, E. S. "Skiing in the Straw." *Recreation*. XXXII: (July 1938), 222.

Vaughn, R. F., and York, H. *Hockey*. (New York: McGraw-Hill, 1938), 367 pp. $3.50.

Vinson, M. Y. *Primer of Figure Skating*. (New York: McGraw-Hill, 1938), 182 pp. $2.75.

Wittich, W. A. "Curling." *Leisure*. V: (Jan. 1938), 21.

WOMEN: DRESS, EXERCISE, HEALTH, ETC.

Buck, H. C. *Programme of Physical Education for Girls' Schools in India*. (New York: Oxford, 1938), 394 pp.

Carpenter, A. "A Critical Study of the Factors Determining Effective Strength

Tests for Women." RES. QUAR. IX: (Dec. 1938), 3.

—— "Strength, Power, and 'Femininity' as Factors Influencing the Athletic Performance of College Women." RES. QUAR. IX: (May 1938), 120.

Cassidy, R. *New Directions in Physical Education for the Adolescent Girl in High School and College.* (New York: Barnes, 1938), 231 pp. $2.50.

Chamberlain, M. S. *Physical Fitness for Women.* (New York: Mill, 1938), 88 pp. $1.00.

Ebeling, A. "Charting Field Hockey Rules." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 504.

Fish, M. E. "Basketball: Essential Differences between the Two-Court and Three-Court Game for Girls of Different Age Levels." RES. QUAR. IX: (Dec. 1938), 69.

Glassow, R. B., Colvin, V., and Schwarz, M. M. "Studies Measuring Basketball Playing Ability of Women in College." RES. QUAR. IX: (Dec. 1938), 60.

Gogle, G. B. *A Workbook in Health for High School Girls.* (New York: Barnes, 1937), 267 pp. $1.00.

Graybeal, E. *The Measurement of Outcomes of Physical Education for College Women.* (Minneapolis: Univ. of Minnesota Press, 1937), 80 pp. $1.00 pa.

Hammond, M. B. "Development of Rhythmic Therapy for Women." *Recreation.* XXXII: (Oct. 1938), 393.

Hellebrandt, F. A., Tepper, R. H., Braun, G. L., and Elliott, M. C. "The Location of the Cardinal Anatomical Orientation Planes Passing Through the Center of Weight in Young Adult Women." *Am. Jr. Physiol.* CXXI: (Feb. 1938), 465.

Ludwig, E. E. "The Women's Physical Education Club of Milwaukee." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 226.

Moss, B. "Recreational Sports for Women." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 432.

Mulvane, V. B. "A Course for High School Girls." *Jr. Health & Phys. Ed.* IX: (Sept. 1938), 440.

Niemoeller, A. F. *Feminine Hygiene in Marriage.* (New York: Harvest House, 1938), 155 pp. $2.00.

Official Basketball Guide for Women with Official Rulebook. (New York: Barnes, 1938), 80 pp. $0.25.

Osborn, V. "National Women's Official's Rating." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 216.

Powdermaker, T. *Physical Education Play Activities for Girls in Junior and Senior High Schools.* (New York: Barnes, 1938), 369 pp. $3.00

"Recreative Physical Training Methods for Women." *Jr. Phys. Ed. & Schl. Hyg.* XXX: (Mar. 1938), 34.

Schwehn, H. M. "The Educational Responsibilities Outside the Classroom of Women Instructors of Physical Education in the State of Indiana." RES. QUAR. IX: (Dec. 1938), 81.

Shuttleworth, F. K. *Adolescent Period: Graphic and Pictorial Atlas.* (Washington, D.C.: Nat'l Res. Council, 1938), 246 pp. $3.00.

—— *Sexual Maturation and Physical Growth of Girls Age Six to Nineteen.* (Washington, D.C.: Nat'l Res. Council, 1938), 253 pp. $1.25.

Snyder, F. F. "Factors Concerned in the Duration of Pregnancy." *Physiol. Rev.* XVIII: (Oct. 1938), 578.

Spencer, R. "Women's Softball League Standards." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 224.

Steinhardt, I. D. Sex Talks to Girls. (Philadelphia: Lippincott, 1938), 221 pp. $1.50.

Willoughby, R. R. "Fertility and Intelligence of College Women." *Science.* LXXXVIII: (Sept. 23, 1938), 281.

MISCELLANEOUS

Affleck, G. B. "Selected Bibliography for 1937." RES. QUAR. IX: (Dec. 1938), 128.

Ambruster, H., and Burritt, N. "Lawlessness in Medicine." *Current History.* XLVIII: (June 1938), 42.

Armbruster, D. A. "Ideas and Opinions." *Beach & Pool.* XII: (Feb. 1938), 7.

Bishop, L. F., Jr. "Your Age and Your Heart." *Hygeia.* XVI: (Feb. 1938), 116.

Brockway, A. "Growing Pains." *Hygeia.* XVI: (Aug. 1938), 711.

Buckner, D. "Social Work and the Physically Handicapped Child in the Development of a New State Program." *Am. Jr. Pub. Health.* XXVIII: (Apr. 1938), 464.

Capes, W. P. "Politics in the Selection of Health Department Personnel: Is There a Remedy?" *Am. Jr. Public Health.* XXVIII: (July 1938), 835.

Carlson, A. D. "The Doctors Face Revolt." *Harper's.* CLXXVI: (Sept. 1938), 391.

Carmichael, O. C. "Education and the Individual." *Jr. Health & Phys. Ed.* IX: (Oct. 1938), 467.

Cathcart, E. P. "Fitness: Its Promotion." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (July 1938), 81.

Cousins, N. "Food for the Trust-Busters." *Curr. Hist.* LXIII: (Feb. 1938), 26.

Cozens, F. W. "The Division of Physical Education." *Jr. Health & Phys. Ed.* IX: (Apr. 1938), 206.

Gesell, A., and Thompson, H. *The Psychology of Early Growth.* (New York: Macmillan, 1938), 290 pp. $4.00.

H. W. "Warfare of Tomorrow: Mobilizing the Microbes." *Living Age.* CCCLIII: (Feb. 1938), 495.

Hamilton, J. B., and Hubert, G. "Photopographic Nature of Tanning of the Human Skin as Shown by Studies of Male Hormone Therapy." *Science.* LXXXVIII: (Nov. 18, 1938), 481.

Harms, E. "The Psychology of Clothes." *Am. Jr. Sociol.* XLIV: (Sept. 1938), 239.

Hinman, S. "The Pendulum Swings Back." *Jr. Health & Phys. Ed.* IX: (Mar. 1938), 134.

Hopkins, A. D. *Bioclimatics: A Science of Life and Climatic Relations.* (Washington, D.C.: Miscellaneous Pub. No. 280 of U. S. Dept. of Agriculture, 1938), 188 pp.

"Hot and Cold." *Hygeia.* XVI: (July 1938), 597.

Linington, P. "The Educational Values of Riding." *Jr. Health & Phys. Ed.* IX: (Mar. 1938), 145–7.

March, J. "How to Make a Bibliography." *Ed. Dance.* I: (June-July 1938), 10.

Newell, J. R. "Recreational Interests of College Alumni and Their Evaluation of College Physical Education." (Grad. Thesis, Springfield College, 1938), 59 pp.

Pickett, J. B. "The Witchery of Walking." *Recreation.* XXXII: (Spr. 1938), 9.

Redpath, C. A. "The Status of Physically Handicapped Children in the Junior High Schools of the First and Second Class Cities of Kansas." (University of Kansas, Master's Thesis, 1938), 44 pp.

Rose, H. "The Language of the Body." *Jr. Phys. Ed. & Sch. Hyg.* XXX: (Mar. 1938), 43.

Shaw, J. H. "Library 'Illiteracy' in Physical Education." *Jr. Health & Phys. Ed.* IX: (Jan. 1938), 15.

Smith, M. "Mobility of Eminent Men." *Sociology & Soc. Research:* XXII: (May-June 1938), 452.

Sprague, A. R. "Studies in the Vocational Interests of Undergraduate Majors in Health and Physical Education." (Grad. Thesis, Springfield College, 1938), 89 pp.

Stephenson, H. "Revolt in the A.M.A." *Current Hist.* XLVIII: (June 1938), 24.

BOOK REVIEWS

SWIMMING POOL STANDARDS. Frederick W. Luehring. (New York: A. S. Barnes and Company, 1939) $5.00.

Among the number of new books published each year which deal with various aspects of physical education, health educaion, and public recreation, there appear some few which stand out as distinctive and lasting contributions. *Swimming Pool Standards* appears to be one of those books.

This book is more than a list of standards for swimming pools, it is, in fact, a source book of information about all sorts of swimming pools and especially swimming pools in educational institutions. Its historical survey of the swimming pool is an addition to our literature on this subject. The influence of national committees on the development of facilities for swimming is reviewed. A short chapter is devoted to a discussion of laws, rules, and legal responsibilities which serves to point out the need for revision and improvement in ordinances and legislation pertaining to swimming pools.

Swimming Pool Standards presents some 378 standards classified under appropriate headings. These standards have been selected in accordance with a set of criteria of a general nature based upon the opinions of authors of books and articles relating to swimming pools. These criteria serve as general guides rather than as objective selective devices.

The presentation of standards, consisting of a statement supported by serially numbered references, and followed by comment in further explanation is such that the reader will at once secure a general idea of desirable and accepted practice. Any lack of objectiveness in the statement of standards is balanced by reference to the readily accessible bibliography of supporting literature.

Probably one of the main contributions of *Swimming Pool Standards* will be found to be the very large bibliography so organized as to enable the reader to find page references quickly relating to any standard under consideration.

In presenting *Swimming Pool Standards,* Dr. Luehring has made a thorough and painstaking contribution of scholarly nature to the better literature in the field of health and physical education.

DAVID K. BRACE
Professor of Physical Education
University of Texas

TESTS AND MEASUREMENTS IN HEALTH AND PHYSICAL EDUCATION. Charles Harold McCloy. (New York: F. S. Crofts & Company, 1939) 392 pages, $3.00.

Those of us who know Dr. McCloy and his prodigious efforts in tests and measurements have been waiting for him to publish a book in this field. That volume is now available in the new Crofts series and will be read by all alert physical educators because of the author's superior technical knowledge.

Dr. McCloy has been a pioneer in this comparatively new field and has probably developed, personally and through his students, more tests than any other person. Moreover, he is admirably fitted for the job through his knowledge of statistics, in which subject he is preeminent among physical educators.

The author has described in detail a large number of tests and measurements in all the phases of health and physical education, many of them previously unpublished. Yet he has omitted the older, less specific tests and included just those which can be of practical value. Descriptions of tests are supplemented by tables, drawings and laboratory suggestions.

Dr. McCloy covers tests of strength, size and maturity, power, motor educability, agility and coordination, track and field events, motor capacity and ability, endurance, special abilities, achievement, health, cardiovascular response, body mechanics, and character. He also includes chapters on administering tests, scoring tables, the use of tests in classification, paper and pencil tests, rating scales, the medical examination, grading physical education activities, and methods of test construction. An excellent bibliography is included.

The author also adds a ten-page chapter on statistical methods, which is the finest condensation of the necessary material in this field that I have ever seen. It does not pretend, of course, to cover the field, but rather to give simply the necessary essentials to an understanding of tests and their construction, interpretation, and use.

The book is a valuable contribution to the field and should make an excellent text for courses in tests and measurements.

C. D. GIAUQUE
George Williams College

HANDICRAFTS AS A HOBBY. Robert E. Dodds. (New York: Harper and Brothers, 1939) 138 pages.

The increased emphasis on the use of leisure time has given added impetus to the developments of hobbies. Handicrafts were once considered activities for children of school age. The idea of adults spending time in tooling leather, block-printing, and other types of handwork activities was rarely mentioned.

The demand for activities to fill in the out-of-work hours was felt. Hobbies of many types were recognized. Many of the hobbies are "as old as the hills" but have been revived and enlarged upon.

The less expensive types of handicrafts form the basis of the chapters in this new addition to the Hobby Series. These crafts may be pursued with the "minimum of equipment," and the methods are explained for the beginner. The "methods and procedures set forth here are so easy to execute and so fascinating that they can be carried out by adults without the aid of an instructor, or by children with a little supervision . . . so that this book may open wide the door which leads to art crafts as a worthy use of leisure."

In the seventeen chapters the contents cover separate types of handicrafts from leather working and tooling and cloth pictures to bead craft and place cards. Recreation workers, camp counselors, and teachers will find this a useful reference for a number of hobby crafts.

JOHN EDGAR CASWELL
Assistant in Intramural Sports
University of Michigan

WOODCRAFT. Bernard S. Mason. (New York: A. S. Barnes & Co., 1939) 580 pages, $2.75.

At intervals, rather infrequently, there appears in various fields of knowledge a publication regarded as a master text, a standard with which other similar books are compared. Certainly Mason's *Woodcraft* has a just claim to this unique distinction.

A pre-sale copy sent to this reviewer was used with a camp counselor training group during July as a textbook and proved most satisfactory to all and a veritable inspiration to those whose projects came within its range. Camps stressing the pioneering aspects of crafts will welcome this publication as a guide and companion.

The phases of campcraft, woodcraft, and crafts based on forest materials are well selected. Each is treated exhaustively in simple language with many excellent illustrations. Directions are clear so that even the tyro may suc-

ceed in securing gratifying results, and still the treatment is so inclusive that the oldtimer too will find much that hitherto he has not tried, the very practicability of which he has not even suspected.

Some of the topics treated are: axemanship, firecraft, beds and duffel, cabins, tepees, shelters temporary and permanent, bark-craft, caches, woodcraft, rope and cordage, woodsy furniture, council rings, rawhide, buckskin, horn, feathers, tincan craft, totem poles, and many knickknacks and gadgets.

Campers and all those who love to live in the woods are under permanent obligation to the author for preparing and A. S. Barnes and Company for publishing in such fine format this eminently practical text. Its wide acceptance is deserved and assured.

G. B. Affleck
Springfield College

A Textbook of Physical Education. Jesse F. Williams, M.D., Sc.D., and Whitelaw R. Morrison, M.D. (2nd ed.; Philadelphia: W. B. Saunders Company, 1939) 349 pages, $2.75.

The second edition of *A Textbook of Physical Education,* by Williams and Morrison, contains no radical changes from the first edition, because it was essentially sound and did not need major modifications; it required only minor alterations to be brought up to date. This the authors have done adequately, thus producing a splendid textbook of physical education on the high school level.

The book is characterized by adequate and interesting pictures and illustrations; by the almost complete absence of long and difficult words; by sound physical education theory brought to the level of the high school pupil; by an easy and interesting style; by marked freedom from uninteresting quotations; by discussion of a variety of popular topics; and by a length that is not great enough to discourage the less mature student.

The charts giving record performances in a variety of sports and the pictures of outstanding performers tend to give the book a flavor that will stimulate the mental appetite of adolescents to the point where more physical education information will be palatable and acceptable.

The chapters on training and caring for oneself in physical education situations are particularly worth while, for in many communities young people do not know the significant training and first-aid facts included therein. Since the everyday essentials are presented simply and plainly, these chapters provide a useful guide not only for the instructor, who may need to refresh his memory concerning maintenance and improvement of good bodily condition, but also for the student who is even more interested in developing and caring for his own body.

Edward F. Voltmer
Director of Physical Education, Albion College, Albion, Michigan

Sports of the World. Louis Trimble. (Los Angeles: Golden Syndicate Pub. Co., 1939) 266 pages, $3.50 (to libraries).

Mr. Trimble has made the attempt to fill "a need for a complete up-to-date work on sports throughout the world." The result is far from satisfactory.

The articles are sketchy and not well written. There is a lack of balance, both in selectivity of material and treatment. Accuracy is wanting in many cases. There are no bibliographic references. There is an index by country and a glossary—which is really an index—of sports. Both are full of errors.

Under baseball, which is one of the longer articles, no mention is made of any player, team, league, or the like. Terminology is omitted entirely. The history of baseball receives but a line or two, with no dates.

This is a sample of one of the sports more fully covered. Others do not fare as well. Football is poorly done and his rules do not agree with the official rules. Trimble says that a surfboard, on a good wave, will reach a speed of

ninety miles an hour! We would like proof of this statement. The depth of racing shells is 9 feet, according to this book—9 inches is more likely. Speedball gets two sentences and both statements are misleading. Trimble's rules for yacht racing are confusing and far from helpful.

It is unfortunate that, with such a promising title, so little useful material is to be found within its covers. The book cannot be recommended to physical educators, recreation people, or to libraries.

WILSON M. RANCK
Public Library
Rochester, New York

PHYSIOLOGY OF MUSCULAR ACTIVITY. Edward C. Schneider. (2nd ed.; Philadelphia: W. B. Saunders Co., 1939).

Those who have found *Physiology of Muscular Activity* a very useful textbook for their major students in physical education should be happy to have a second edition available. Incorporated in it is a good share of the research work of the last five years significant to an understanding of the effects of exercise. Dr. Schneider is a much-loved and respected physiologist. Physical educators are fortunate that his interest in exercise has resulted in a book applied so directly to their field.

As Schneider states in his preface, evidence does not permit a dogmatic answer to many debatable questions. Scientist that he is, rather than attempt an answer in such cases, he presents both sides of the topic as they are supported by experimental investigation. It is not an elementary physiology text, but designed for students who have had at least an introductory course in anatomy and physiology. It also assumes some knowledge of physics and chemistry. Supplemented with readings in the periodical literature, it could be used for more advanced students.

The organization of the book is essentially that of the first edition. After individual consideration of the muscular, respiratory, and cardio-vascular systems in relation to exercise, there follows a discussion of the agencies of control by means of which their coordination is effected upon exertion. The last third of the text is devoted to such practical problems as training, fatigue and staleness, tests of physical fitness, medical aspects of heavy athletics and heavy industrial work, physical work in relation to external temperature and adaptation, and physical exertion at high altitudes.

ELIZABETH BROGDON
Department of Physiology
University of Wisconsin

OH, DOCTOR! MY FEET! Dudley J. Morton, M.D. (New York: D. Appleton-Century Co., 1939) 111 pages, $1.50.

"Foot trouble is still one of the most common forms of physical ailment." And yet interest in any sports or physical education cannot last long if one's feet are aching. Dr. Morton is an orthopedic surgeon whose interest in foot care dates back to before the World War, the War serving to intensify this interest because of what it revealed to him as an examiner of drafted recruits.

His outstanding work in the foot field won for Dr. Morton an appointment to the Orthopedic Division of the Surgical Department of the Yale University School of Medicine, where, in addition to the University and Hospital work, he was put in charge of all foot disorders among the student body.

While at Yale he designed special instruments for foot examinations—instruments which make possible the same careful diagnosis of foot ailments as are offered by the blood pressure apparatus and cardiograph for the study of the heart and its disorders. Dr. Morton contends that "the feet deserve professional care just as much as any other parts of our bodies."

It is his belief that proper diagnosis of foot troubles cannot be made without the aid of the X-ray. All of the illustrations in his book are photographic reproductions of X-ray plates he has taken. A glance at any of these quickly shows how valuably revealing they are.

He explodes the idea of "fallen meta-

tarsal arches," boldly stating that there is—"no such animal as a metatarsal arch," despite the fact that "the belief in its existence is one the most persistent of the mistaken ideas" about feet. Yes, even though "this non-existent arch is still referred to in standard textbooks."

Each chapter is written in a conversational style. Patients come to the noted surgeon's office and tell him their foot woes. He diagnoses, explains, discusses, advises, and prescribes. This, it seems, is a unique procedure since foot trouble—"the stepchild of modern medicine"—is so often referred by physicians and surgeons to men outside the profession. A built-in arch, a leather lift here or there, a ready-made support, is the usual recommendation, the actual work being done, as a rule, by some shoe repair man.

Dr. Morton does not approve of turning over the responsibility to nonprofessional people; nor does he believe that shoemen should continue in "undisputed possession of the foot-disorder field."

His little book (it can be read through in an hour), serves two purposes. It gives very excellent advice on home care of the feet and at the same time serves as a challenge to intelligent readers. When the suffering public demands that physicians and surgeons cease "passing the buck" and take time instead to study and solve foot troubles, there will be more participants in sports and fewer sitting on the sidelines.

BEULAH FRANCE, R.N.
New York City

EMOTIONS AND BODILY CHANGES. H. Flanders Dunbar. (2nd ed.; New York: Columbia Univ. Press, 1938).

As indicated in the subtitle, *Emotions and Bodily Changes* is a survey of literature on psychosomatic interrelationships, 1910–1933. This second edition makes no attempt to bring the material up to date further than by adding an introductory chapter of a general nature. Dunbar feels that revision of the book as a whole has been rendered less necessary because the first volumes of a new journal, "Psychosomatic Medicine," will contain reviews of the literature of the past five years. Then too, he says that incorporation of recent material, although more satisfying, would not have changed the general point of view of the book. And it is the point of view that is particularly important here rather than the actual contents. The volume is definitely a plea not only for the recognition of the interrelationship existing between psychic and somatic processes in health and disease, but for further research to demonstrate the mechanisms involved. Throughout the book the treatment of individual papers is of necessity brief, almost 2500 of them being listed in the bibliography. In most cases, the final conclusions of a worker are given in direct quotation. The serious student is thus directed to the original report for his own evaluation of the investigations.

The book is divided into three parts. The first is concerned with the general problem of psychosomatic interrelationships and a discussion of methods of approach. Admirable emphasis is placed upon the importance in research of making serial observations over a period of time, rather than depending entirely upon isolated measurements which may fail entirely to yield a true picture of a given function. The major portion of the book covers both experimental and clinical material, arranged according to organ systems, illustrative of disturbances of equilibrium either within the organism itself or between the organism and its environment. Much of the material presented is provocative and seems to indicate that biological processes can be influenced through the psyche in ways increasingly subject to control. Measures of control such as environmental therapy, suggestion, hypnosis, and psychoanalysis are discussed briefly in the final section of the monograph, and attention is focused upon a number of therapeutic errors equally applicable in both the psychic and somatic spheres.

ELIZABETH BROGDON
Department of Physiology, University of Wisconsin

Cumulative Author, Subject Matter, and Title Index for Vol. X. (1939)

Research Quarterly of the American Association for Health, Physical Education, and Recreation

Numbers refer to: First — Number of issue; Second — Page Number, e.g., 3:114 refers to Number 3 (October), page 114.

Number 1, March; Number 2, May; Number 3, October; Number 4, December.

Abstract: A National Study of the Incidence of Accidents in High School Wrestling, 1937-1938. Claude C. Reeck. 1:72.

AFFLECK, G. B.
Selected Bibliography for 1938. 4:103.

ALEXANDER, C. S.
Vitality Indexes for Summer Camps. 2:102.

Analysis of the Components of Tests of Semicircular Canal Function and of Static and Dynamic Balance, An. Ruth I. Bass. 2:33.

APGAR, Sara L. (and Joanna T. Dyer and Jennie C. Schurig)
A Basketball Motor Ability Test for College Women and Secondary School Girls. 3:128.

ARMBRUSTER, David (and W. W. Tuttle and Lawrence E. Morehouse)
Two Studies in Swimming Starts. 1:89.

Assessment of Motor Abilities of College Women through Objective Tests, The. M. Gladys Scott. 3:63.

BARRETT, Vince Frank
Liability in Athletics in Oregon. 1:99.

Basketball Motor Ability Test for College Women and Secondary School Girls, A. Joanna T. Dyer, Jennie C. Schurig, and Sara L. Apgar. 3:128.

BASS, Ruth I.
An Analysis of the Components of Tests of Semicircular Canal Function and of Static and Dynamic Balance. 2:33.

BELL, William M.
The Sociological Contributions of Physical Education to the Needs of the Negro. 2:137.

BIBLIOGRAPHIES
A Bibliography of Textbooks in Health Education for the Elementary and High Schools. H. F. Kilander. 2:25.
A Selected Bibliography of the Dance in Health, Hygiene, and Physiology. Paul David Magriel. 2:113.
Selected Bibliography for 1938. G. B. Affleck. 4:103.

Bibliography of Textbooks in Health Education for the Elementary and High Schools, A. H. F. Kilander. 2:25.

BOOK REVIEWS
1:154; 2:157; 3:155; 4:155.

BOOKWALTER, Karl W.
A Critical Evaluation of Some of the Existing Means of Classifying Boys for Physical Education. 3:119.

Brief Survey of the Present Status of the Health and Physical Education Requirement for Men Students in Colleges and Universities, A. K. J. McCristal and Emil A. Miller. 4:70.

BUCHER, Clum C. (and Lloyd L. Messersmith)
The Distance Traversed by Big Ten Basketball Players. 3:61.

CAHN, L. Joseph
The Factor of Age in Teaching Physical Education. 2:92.

Changes in the Ages and Physical Measurements of Entering Students at the University of Michigan. Clifford J. Hoffmann. 3:84.

Chemical Factors of Fatigue. John T. Goorley. 4:89.

Civilian Conservation Corps as a Builder of Physical Fitness in Youth, The. G. A. Walker. 2:97.

COBB, Louise S.
The Coeducational Physical Education Class Program at the College Level. 4:20.

CODWELL, John E.
The Status of Physical Education for Boys in the State Accredited Class A High Schools for Negroes in Texas. 2:115.

Coeducational Physical Education Class Program at the College Level, The. Louise S. Cobb. 4:20.

CONN, Elisebeth (and Helen Pendergast and Margaret McCall)
A Survey to Determine the Status of Soccer for Women in Colleges and Universities of the South, Combined with a Survey of Methods of Teaching Soccer. 4:66.

Comparison of Two Methods of Teaching Hygiene to College Freshmen, A. F. S. Kent and H. A. Prentice. 2:133.

CORNELY, Paul B.
Health Problems of the Self-Supporting Student. 3:101.

CRAIG, H. W.
Sports Interests and Attitudes of Students Enrolled in the Service Curriculum in Physical Education at the University of Illinois. 2:143.

Critical Evaluation of Some of the Existing Means of Classifying Boys for Physical Education, A. Karl W. Bookwalter. 3:119.

CROSSLIN, Hiawatha
A Study of the Comparative Recreational Values of Volleyball with Team Games, Dual, and Individual Activities for College Women. 2:128.

CURETON, Thomas Kirk, Jr.
Elementary Principles and Techniques of Cinematographic Analysis as Aids in Athletic Research. 2:3.
Standards for Testing Beginning Swimming. 4:54.

CUSHMAN, Wesley P.
Library Research that Works. 1:113.

DEAVER, G. G.
Exercise and Heart Disease. 1:24.

Development of Public Recreation in Metropolitan Chicago, The. Elizabeth Halsey. 3:15.

Distance Traversed by Big Ten Basketball Players, The. Lloyd L. Messersmith and Clum C. Bucher. 3:61.

DUPAIN, George Z.
Specific Diets and Athletic Fitness: A Preliminary Investigation. 4:33.

DYER, Joanna T. (and Jennie C. Schurig and Sara L. Apgar)
A Basketball Motor Ability Test for College Women and Secondary School Girls. 3:128.

Effect of the Elimination of the Center Jump on the Game of Basketball. Wilho Frigard. 2:151.

EKDAHL, George C.
A Study of the Most Popular Games of Low Organization—Grades I-VI. 1:120.

ELBEL, E. R.
A Study in Variation in Response Time. 1:35.

Elementary Principles and Techniques of Cinematographic Analysis as Aids in Athletic Research. Thomas Kirk Cureton, Jr. 2:3.

ELLIS, A. W.
The Status of Health and Physical Education for Women in Negro Colleges and Universities. 1:135.

Exercise and Heart Disease. G. G. Deaver. 1:24.

Experimental Analysis of Running and of Certain Fundamental Differences between Trained and Untrained Runners, An. Alfred W. Hubbard. 3:28.

Experiment in Self-Directed Study for College Freshmen, An. Paul D. Guernsey. 4:60.

Factor of Age in Teaching Physical Education, The. L. Joseph Cahn. 2:92.

Fair Sex in Greek Society, The. Thomas Woody. 2:57.

Field of Research in Recreation, The. Martin H. Neumeyer. 4:11.

FOSSE, Agatha R.
Safety Education as Provided in Elementary and High School Courses of Study in Large Cities. 3:105.

FRIGARD, Wilho
Effect of the Elimination of the Center Jump on the Game of Basketball. 2:150.

GOORLEY, John T.
Chemical Factors of Fatigue. 4:89.

Grade Placement of Folk Dances. Emil Rath. 1:51.

GRAYBEAL, Elizabeth
A Study of Teaching Difficulties in Physical Education. 2:84.

GUERNSEY, Paul D.
An Experiment in Self-Directed Study for College Freshmen. 4:60.

HALSEY, Elizabeth
The Development of Public Recreation in Metropolitan Chicago. 3:15.

HANSSON, K. G.
Vital Capacity in Trunk Deformities. 2:77.

HEALTH, HEALTH EDUCATION, HYGIENE
A Comparison of Two Methods of Teaching Hygiene to College Freshmen. F. S. Kent and H. A. Prentice. 2:133.
A Health Knowledge Survey. David T. Loy and M. W. Husband. 2:53.
Health Problems of the Self-Supporting Student. Paul B. Cornely. 3:101.
How Much Do College Women Know About Syphilis and Gonorrhea? Sylvia Orringer. 1:80.
Medical and Physical Education Examinations of Freshmen and New High School Students in the Public Schools of Seattle, Washington, School Year 1937-1938. Arthur E. Wade. 1:86.
A Selected Bibliography of the Dance in Health, Hygiene, and Physiology. Paul David Magriel. 2:113.

Health Knowledge Survey, A. David T. Loy and M. W. Husband. 2:53.

Health Problems of the Self-Supporting Student. Paul B. Cornely. 3:101.

HELLEBRANDT, Frances A. (and Margaret H. Meyer)
Physiological Data Significant to Participation by Women in Physical Activities. 1:10.

HEWITT, Jack E.
Improving the Construction of the Essay and Objective New Type Examination. 3:148.

HISTORICAL
The Development of Public Recreation in Metropolitan Chicago. E. Halsey. 3:15.
The Fair Sex in Greek Society. Thomas Woody. 2:57.

HJELTE, George
Research in Recreation. 1:3.

HODGSON, Pauline
Studies in the Physiology of Activity: III. On Certain Reactions of College Women Following Participation in Three-Court Basketball. 3:53.

HODGSON, Pauline (and Isabel B. Kane)
A Study of Factors Influencing Participation of College Women in an Elective Program of Physical Education. 1:57.

HOFFMANN, Clifford J.
Changes in the Ages and Physical Measurement of Entering Students at the University of Michigan. 3:84.

HOWE, Eugene C. (and Elizabeth Powell)
Motor Ability Tests for High School Girls. 4:81.

How Much Do College Women Know About Syphilis and Gonorrhea? Sylvia Orringer. 1:80.

HUBBARD, Alfred W.
An Experimental Analysis of Running and of Certain Fundamental Differences between Trained and Untrained Runners. 3:28.

HUSBAND, M. W. (and David T. Loy)
A Health Knowledge Survey. 2:53.

Improving the Construction of the Essay and Objective New Type Examination. Jack E. Hewitt. 3:148.

JACKSON, C. O.
Physical Education in the Junior High Schools of Illinois. 1:124.

KANE, Isabel B. (and Pauline Hodgson)
A Study of Factors Influencing Participation of College Women in an Elective Program of Physical Education. 1:57.

KARPOVICH, Peter V.
Respiration in Swimming and Diving. 3:3.

KENT, F. S. (and H. A. Prentice)
A Comparison of Two Methods of Teaching Hygiene to College Freshmen. 2:133.

KILANDER, H. F.
A Bibliography of Textbooks in Health Education for the Elementary and High Schools. 2:25.

KORB, Edward Martin
A Method to Increase the Validity of Measuring Posture. 1:142.

Liability in Athletics in Oregon. Vince Frank Barrett. 1:99.

Library Research that Works. Wesley P. Cushman. 1:113.

LOY, David T. (and M. W. Husband)
A Health Knowledge Survey. 2:53.

MAGRIEL, Paul David
A Selected Bibliography of the Dance in Health, Hygiene, and Physiology. 2:113.

MARSHALL, M. W. (and B. N. Nagle)
Sports in Which Men Over Age Twenty Engage. 1:75.

MATEEFF, Dragomir
The Physical Development of Students in the Bulgarian Gymnasiums. 3:39.

McCALL, Margaret (and Elisebeth Conn and Helen Pendergast)
A Survey to Determine the Status of Soccer for Women in Colleges and Universities of the South, Combined with a Survey of Methods of Teaching Soccer. 4:66.

McCLOY, C. H.
Some Unexplored Areas for Research. 4:3.

McCRISTAL, K. J. (and Emil A. Miller)
A Brief Survey of the Present Status of the Health and Physical Education Requirement for Men Students in Colleges and Universities. 4:70.

McMURRAY, Roy J.
A Survey of Special Interest Activities. 1:117.

Medical and Physical Education Examinations of Freshmen and New High School Students in the Public Schools of Seattle, Washington, School Year 1937-1938. Arthur E. Wade. 1:86.

MESSERSMITH, Lloyd L. (and Clum C. Bucher)
The Distance Traversed by Big Ten Basketball Players. 3:61.

METHENY, Eleanor
Some Differences in Bodily Proportions between American Negro and White Male College Students as Related to Athletic Performance. 4:41.

Method to Increase the Validity of Measuring Posture, A. Edward Martin Korb. 1:142.

MEYER, Margaret H. (and Frances A. Hellebrandt)
Physiological Data Significant to Participation by Women in Physical Activities. 1:10.

MILLER, Emil A. (and K. J. McCristal)
A Brief Survey of the Present Status of the Health and Physical Education Requirement for Men Students in Colleges and Universities. 4:70.

MOREHOUSE, Lawrence E. (and W. W. Tuttle and David Armbruster)
Two Studies in Swimming Starts. 1:89.

MOTION PICTURES
Elementary Principles and Techniques of Cinematographic Analysis as Aids in Athletic Research. Thomas Kirk Cureton, Jr. 2:3.
A Motion Picture Questionnaire. Jenny E. Turnbull. 2:154.

Motion Picture Questionnaire, A. Jenny E. Turnbull. 2:154.

Motor Ability Tests for High School Girls. Elizabeth Powell and Eugene C. Howe. 4:81.

NAGLE, B. N. (and M. V. Marshall)
Sports in Which Men Over Age Twenty Engage. 1:75.

NEUMEYER, Martin H.
The Field of Research in Recreation. 4:11.

NORDLY, Carl L.
University of Minnesota Study of Physical Education Facilities and Equipment of the Accredited Public Secondary Schools of Minnesota. 2:122.

OBJECTIVES—Standards
A Brief Survey of the Present Status of the Health and Physical Education Requirement for Men Students in Colleges and Universities. K. J. McCristal and Emil A. Miller. 4:70.
The Status of Health and Physical Education for Women in Negro Colleges and Universities. A. W. Ellis. 1:135.
The Status of Physical Education for Boys in the State Accredited Class A High Schools for Negroes in Texas. John E. Codwell. 2:115.

ORRINGER, Sylvia
How Much Do College Women Know About Syphilis and Gonorrhea? 1:80.

PATTERSON, Bryan
Prediction in Physical Education. 1:67.

PENDERGAST, Helen (and Elisebeth Conn and Margaret McCall)
A Survey to Determine the Status of Soccer for Women in Colleges and Universities of the South, Combined with a Survey of Methods of Teaching Soccer. 4:66.

Physical Development of Students in the Bulgarian Gymnasiums, The. Dragomir Mateeff. 3:39.

Physical Education in the Junior High Schools of Illinois. C. O. Jackson. 1:124.

Physiological Data Significant to Participation by Women in Physical Activities. Frances A. Hellebrandt and Margaret H. Meyer. 1:10.

POSTURE
A Method to Increase the Validity of Measuring Posture. Edward Martin Korb. 1:142.

POWELL, Elizabeth (and Eugene C. Howe)
Motor Ability Tests for High School Girls. 4:81.

Prediction in Physical Education. Bryan Patterson. 1:67.

PRENTICE, H. A. (and F. S. Kent)
A Comparison of Two Methods of Teaching Hygiene to College Freshmen. 2:133.

PROFESSIONAL TRAINING
A Study of the Content of Professional Courses in Physical Education. Tom Scott. 2:78.

PROGRAMS
Grade Placement of Folk Dances. Emil Rath. 1:51.
The Coeducational Physical Education Class Program at the College Level. Louise S. Cobb. 4:20.
An Experiment in Self-Directed Study for College Freshmen. Paul D. Guernsey. 4:60.
Physical Education in the Junior High Schools of Illinois. C. O. Jackson. 1:124.
Safety Education as Provided in Elementary and High School Courses of Study in Large Cities. Agatha R. Fosse. 3:105.
Sports Interests and Attitudes of Students Enrolled in the Service Curriculum in Physical Education at the University of Illinois. H. W. Craig. 2:143.

Sports in Which Men Over Age Twenty Engage. M. V. Marshall and B. N. Nagle. 1:75.
A Study of Factors Influencing Participation of College Women in an Elective Program of Physical Education. Isabel B. Kane and Pauline Hodgson. 1:57.
A Survey of Special Interest Activities. Roy J. McMurray. 1:117.

RATH, Emil
Grade Placement of Folk Dances. 1:51.

RECREATION
The Development of Public Recreation in Metropolitan Chicago. Elizabeth Halsey. 3:15.
The Field of Research in Recreation. Martin H. Neumeyer. 4:11.
Research in Recreation. George Hjelte. 1:3.
A Study of the Comparative Recreational Values of Volleyball with Team Games, Dual, and Individual Activities for College Women. Hiawatha Crosslin. 2:128.
A Survey of Recreational Interests and Pursuits of College Women. Ruth Toogood. 3:90.

REECK, Claude C.
Abstract: A National Study of Incidence of Accidents in High School Wrestling, 1937-1938. 1:72.

RESEARCH—Athletics.
Abstract: A National Study of Incidence of Accidents in High School Wrestling, 1937-1938. Claude C. Reeck. 1:72.
Effect of the Elimination of the Center Jump on the Game of Basketball. Wilho Frigard. 2:150.
Elementary Principles and Techniques of Cinematographic Analysis as Aids in Athletic Research. Thomas Kirk Cureton, Jr. 2:3.
An Experimental Analysis of Running and of Certain Fundamental Differences between Trained and Untrained Runners. Alfred W. Hubbard. 3.28.
Liability in Athletics in Oregon. Vince Frank Barrett. 1:99.
A Survey to Determine the Status of Soccer for Women in Colleges and Universities of the South, Combined with a Survey of Methods of Teaching Soccer. Elisebeth Conn, Helen Pendergast, and Margaret McCall. 4:66.
Two Studies in Swimming Starts. W. W. Tuttle and Lawrence E. Morehouse and David Armbruster. 1:89.

RESEARCH—Miscellaneous
Changes in the Ages and Physical Measurements of Entering Students at the University of Michigan. Clifford J. Hoffmann. 3:84.
The Civilian Conservation Corps as a Builder of Physical Fitness in Youth. G. A. Walker. 2:97.
The Distance Traversed by Big Ten Basketball Players. Lloyd L. Messersmith and Clum C. Bucher. 3:61.
The Factor of Age in Teaching Physical Education. L. Joseph Cahn. 2:92.
Library Research that Works. Wesley P. Cushman. 1:113.
The Sociological Contributions of Physical Education to the Needs of the Negro. William M. Bell. 2:137.
Some Unexplored Areas for Research. C. H. McCloy. 4:3.
A Study of the Most Popular Games of Low Organization—Grades I-VI. George C. Ekdahl. 1:121.
A Study of Teaching Difficulties in Physical Education. Elizabeth Graybeal. 2:84.
University of Minnesota Study of Physical Education Facilities and Equipment of the Accredited Public Secondary Schools of Minnesota. Carl L. Nordly. 2:122.

RESEARCH—Physiological
An Analysis of the Components of Tests of Semicircular Canal Function and of Static and Dynamic Balance. Ruth I. Bass. 2:33.
Chemical Factors of Fatigue. John T. Goorley. 4:89.
Exercise and Heart Disease. G. G. Deaver. 1:24.
The Physical Development of Students in the Bulgarian Gymnasiums. Dragomir Mateeff. 3:39.
Physiological Data Significant to Participation by Women in Physical Activities. Frances A. Hellebrandt and Margaret H. Meyer. 1:10.
Some Differences in Bodily Proportions between American Negro and White Male College Students as Related to Athletic Performance. Eleanor Metheny. 4:41.
Specific Diets and Athletic Fitness: A Preliminary Investigation. George Z. Dupain. 4:33.
Studies in the Physiology of Activity: III. On Certain Reactions of College Women Following Participation in Three-Court Basketball. Pauline Hodgson. 3:53.
A Study in Variation in Response Time. E. R. Elbel. 1:35.
Respiration in Swimming and Diving. Peter V. Karpovich. 3:3.

Research in Recreation. George Hjelte. 1:3.

Respiration in Swimming and Diving. Peter V. Karpovich. 3:3.

RODGERS, Elizabeth G.
The Standardization and Use of Objective Type Information Tests in Team Game Activities. 1:102.

Safety Education as Provided in Elementary and High School Courses of Study in Large Cities. Agatha R. Fosse. 3:105.

SCHURIG, Jennie C. (and Joanna T. Dyer and Sara L. Apgar)
A Basketball Motor Ability Test for College Women and Secondary School Girls. 3:128.

SCOTT, M. Gladys
The Assessment of Motor Abilities of College Women through Objective Tests. 3:63.

SCOTT, Tom
A Study of the Content of Progressional Courses in Physical Education. 2:78.

Selected Bibliography for 1938. G. B. Affleck. 4:103.

Selected Bibliography of the Dance in Health, Hygiene, and Physiology, A. Paul David Magriel. 2:113.

Sociological Contributions of Physical Education to the Needs of the Negro, The. William M. Bell. 2:137.

Some Differences in Bodily Proportions between American Negro and White Male College Students as Related to Athletic Performance. Eleanor Metheny. 4:41.

Some Unexplored Areas for Research. C. H. McCloy. 4:3.

Specific Diets and Athletic Fitness: A Preliminary Investigation. George Z. Dupain. 4:33.

Sports Interests and Attitudes of Students Enrolled in the Service Curriculum in Physical Education at the University of Illinois. H. W. Craig. 2:143.

Sports in Which Men Over Age Twenty Engage. M. V. Marshall and B. N. Nagle. 1:75.

Standardization and Use of Objective Type Information Tests in Team Game Activities, The. Elizabeth G. Rodgers. 1:102.

Standards for Testing Beginning Swimming. Thomas Kirk Cureton, Jr. 4:54.

Status of Health and Physical Education for Women in Negro Colleges and Universities, The. A. W. Ellis. 1:135.

Status of Physical Education for Boys in the State Accredited Class A High Schools for Negroes in Texas, The. John E. Codwell. 2:115.

Studies in the Physiology of Activity: III. On Certain Reactions of College Women Following Participation in Three-Court Basketball. Pauline Hodgson. 3:53.

Study in Variation in Response Time, A. E. R. Elbel. 1:35.

Study of Factors Influencing Participation of College Women in an Elective Program of Physical Education, A. Isabel B. Kane and Pauline Hodgson. 1:57.

Study of Teaching Difficulties in Physical Education, A. Elizabeth Graybeal. 2:84.

Study of the Comparative Recreational Values of Volleyball with Team Games, Dual, and Individual Activities for College Women, A. Hiawatha Crosslin. 2:128.

Study of the Content of Professional Courses in Physical Education, A. Tom Scott. 2:78.

Study of the Most Popular Games of Low Organization—Grades I-VI, A. George Ekdahl. 1:120.

Study of the Standardization of Exercise for Use in the Pulse-Ratio Test, A. W. W. Tuttle. 1:150.

Survey of Recreation Interests and Pursuits of College Women, A. Ruth Toogood. 3:90.

Survey of Special Interest Activities, A. Roy J. McMurray. 1:117.

Survey to Determine the Status of Soccer for Women in Colleges and Universities of the South, Combined with a Survey of Methods of Teaching Soccer, A. Elisebeth Conn, Helen Pendergast, and Margaret McCall. 4:66.

TESTING (see also Research—Physiological)

An Analysis of the Components of Tests of Semicircular Canal Function and of Static and Dynamic Balance. Ruth I. Bass. 2:33.

The Assessment of Motor Abilities of College Women through Objective Tests. M. Gladys Scott. 3:63.

A Basketball Motor Ability Test for College Women and Secondary School Girls. Joanna T. Dyer, Jennie C. Schurig, and Sara L. Apgar. 3:128.

A Critical Evaluation of Some of the Existing Means of Classifying Boys for Physical Education. Karl W. Bookwalter. 3:119.

Improving the Construction of the Essay and Objective New Type Examination. Jack E. Hewitt. 3:148.

Motor Ability Tests for High School Girls. Elizabeth Powell and Eugene C. Howe. 4:81.

Prediction in Physical Education. Bryan Patterson. 1:67.

The Standardization and Use of Objective Type Information Tests in Team Game Activities. Elizabeth G. Rodgers. 1:102.

Standards for Testing Beginning Swimming. Thomas Kirk Cureton, Jr. 4:54.

A Study of the Standardization of Exercise for Use in the Pulse-Ratio Test. W. W. Tuttle. 1:150.

Vitality Indexes for Summer Camps. C. S. Alexander. 2:102.

THERAPEUTICS

Vital Capacity in Trunk Deformities. K. G. Hansson. 2:72.

TOOGOOD, Ruth

A Survey of Recreational Interests and Pursuits of College Women. 3:90.

TURNBULL, Jenny E.

A Motion Picture Questionnaire. 2:154.

TUTTLE, W. W.

A Study of the Standardization of Exercise for Use in the Pulse-Ratio Test. 1:150.

TUTTLE, W. W. (and Lawrence E. Morehouse and David Armbruster)

Two Studies in Swimming Starts. 1:89.

Two Studies in Swimming Starts. W. W. Tuttle and Lawrence E. Morehouse and David Armbruster. 1:89.

University of Minnesota Study of Physical Education Facilities and Equipment of the Accredited Public Secondary Schools of Minnesota. Carl L. Nordly. 2:112.

Vital Capacity in Trunk Deformities. K. G. Hansson. 2:72.

Vitality Indexes for Summer Camps. C. S. Alexander. 2:102.

WADE, Arthur E.

Medical and Physical Education Examinations of Freshmen and New High School Students in the Public Schools of Seattle, Washington, School Year 1937-1938. 1:86

WALKER, G. A.

The Civilian Conservation Corps as a Builder of Physical Fitness in Youth. 2:97.

WOODY, Thomas

The Fair Sex in Greek Society. 2:57.

Life and Honorary Members

American Association for Health, Physical Education, and Recreation

*Ainsworth, Dorothy, 15 Barrett Place, Northampton, Mass.

Anderson, W. G., M.D., Box 1802, Yale Station, New Haven, Connecticut.

*Bell, Margaret, M.D., University of Michigan, Ann Arbor, Michigan.

Day, William E., 1377 Princeton Ave., Salt Lake City, Utah.

Delta Theta Epsilon, University of Illinois, Urbana, Illinois.

Dupain, George Z., Rose Bank, 158 Parramatta Road, Ashfield, N.S.W., Australia.

*Elliott, E. S., Dept. of Physical Education, Columbia University, New York City.

*Gates, Grover, 835 Hampton Way, Fresno, California.

*Gianquc, C. D., George Williams College, Chicago, Ill.

Hillyer, J. Blake, 143 Henry St., Brooklyn, New York.

*Langton, Dr. Clair V., Dean, School of Health and Phys. Educ., Oregon State Agricultural College, Corvallis, Oregon.

*Lee, Mabel, University of Nebraska, Lincoln, Nebraska.

*Luehring, F. W., 435 Riverview Rd., Swarthmore, Pa.

*McCurdy, J. H., M.D., 93 Westford Ave., Springfield, Massachusetts.

McKinstry, Helen, Russel Sage College, Troy, New York.

*Metcalf, T. N., Dir. of Athletics, University of Chicago, Ill.

*Mitchell, Dr. E. D., University of Michigan, Ann Arbor, Michigan.

*Moore, Rodgers, P.O. Box 911, Visalia, Calif.

*Moorhead, W. G., 1710 N. Second St., Harrisburg, Pa.

*Moulton, Gertrude E., M.D., 191 Forest Ave., Oberlin, Ohio.

N. P. Neilson, 1201 Sixteenth St., N. W., Washington, D. C.

*Norris, Dr. J. Anna, 1429 East River Road, Minneapolis, Minn.

*Posse College of Physical Education and Hygiene, 139 Glenwood Ave., East Orange, New Jersey.

*Siler, J. Granville, Dir. of P. & H. E., Porterville Union H. S. & Jr. College, Porterville, California.

*Sparks, Leslie J., Willamette Univ., Salem, Oregon.

*Stafford, Grace M., Secretary, Health Educ. Dept. Metropolitan Y.W.C.A., Chicago, Ill.

Stecher, William A., 1210 Darby Road, Upper Darby, Pennsylvania.

*Streit, William K., Dir. of Phys. Education, Board of Education, Cincinnati, Ohio.

*Swain, Leslie E., Brown University, Providence, Rhode Island.

---

*Life Members.

REPRINTS

from past issues of the Research Quarterly

Q [illegible] C. G. Deaver, *Exercise and Heart Disease* .....

Q [illegible] L. R. Elbel, *A Study in Variation in Response Time* .....

Q [illegible] Arthur E. Wade, *Medical and Physical Education Examinations of [illegible] men and New High School Students in the Public Schools of [illegible] Washington, School Year, 1937–1938* .....

Q [illegible] W. W. Tuttle, *A Study of the Standardization of Exercise for Use in [illegible] Pulse-Ratio Test* .....

Q [illegible] W. W. Tuttle and Lawrence E. Morehouse, *Two Studies in Swimming [illegible] Scores* .....

Q [illegible] Isabel B. Kane, *A Study of Factors Influencing Participation of College [illegible] Women in an Elective Program of Physical Education* .....

Q [illegible] Thomas Woody, *The Fair Sex in Greek Society* .....

Q [illegible] Ruth I. Bass, *An Analysis of the Components of Tests and Semi-Circular [illegible] Canal Function and of Static and Dynamic Balance* .....

Q [illegible] Thomas K. Cureton, Jr., *Elementary Principles and Techniques of Cinematographic Analysis as Aids in Athletic Research* .....

Q [illegible] Carl L. Nordly, *University of Minnesota Study of Physical Education [illegible] Facilities and Equipment of the Accredited Public Secondary Schools [illegible] of Minnesota* .....

Q [illegible] K. G. Hansson, *Vital Capacity in Trunk Deformities* .....

Q [illegible] G. A. Walker, *The Civilian Conservation Corps as a Builder of Physical [illegible] Fitness in Youth* .....

Q [illegible] John E. Coldwell, *The Status of Physical Education for Boys in the [illegible] Accredited Class A High Schools for Negroes in Texas* .....

Q [illegible] Emilio Frigard, *Effect of the Elimination of the Center Jump on the Game [illegible] of Basketball* .....

Q [illegible] Hiawatha Crosslin, *A Study of the Comparative Recreational Values [illegible] of Volleyball with Team Games, Dual, and Individual Activities for College [illegible] Women* .....

Q [illegible] Elizabeth Grayseal, *A Study of Teaching Difficulties in Physical [illegible] Education* .....

Q [illegible] William M. Bell, *The Sociological Contributions of Physical Education to [illegible] the Needs of the Negro* .....

Q [illegible] David T. Loy, *A Health Knowledge Survey* .....

Q [illegible] Alfred W. Hubbard, *An Experimental Analysis of Running and of Certain [illegible] Fundamental Differences Between Trained and Untrained Runners* .....

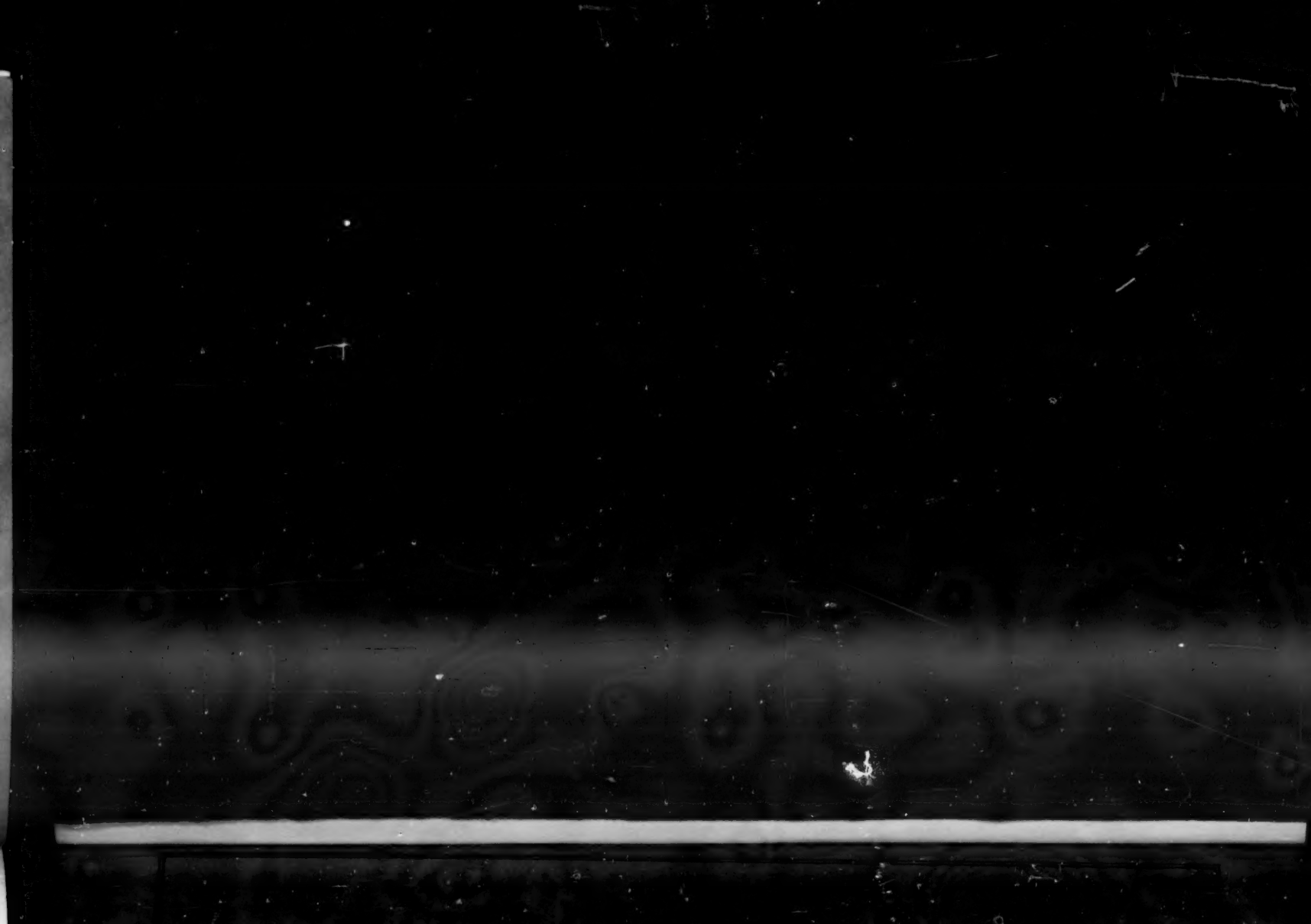
Q [illegible] Elizabeth Halsey, *The Development of Public Recreation in Metropolitan Chicago* .....

Q [illegible] M. Gladys Scott, *The Assessment of Motor Abilities of College Women [illegible] Through Objective Tests* .....

Q [illegible] Karl W. Bookwalter, *A Critical Evaluation of Some of the Existing Methods [illegible] of Classifying Boys for Physical Education* .....

Q [illegible] Jack E. Hewitt, *Improving the Construction of the Essay and Objective [illegible] New Type Examination* .....

Order by number from

American Association for Health, Physical Education, and Recreation

1201 Sixteenth St., Northwest Washington, D. C.